Types EZH and EZHSO Pressure Reducing Regulators

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Figure 1. *Type EZH Pressure Reducing Regulator*

TYPE PRX-120 **TYPE PRX-120/AP**

Figure 2. *PRX Series Pressure Reducing Pilots*

WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage and personal injury or death.

Fisher® regulators must be installed, operated, and maintained in accordance with federal, state, and local codes, rules and regulations, and Emerson Process Management Regulator Technologies, Inc. (Regulator Technologies) instructions.

If the regulator vents gas or a leak develops in the system, service to the unit may be required. Failure to correct trouble could result in a hazardous condition.

Call a gas service person to service the unit. Only a qualified person must install or service the regulator.

Types **EZH, EZHSO, EZH OS2,** and **EZHSO OS2** regulators are in conformity with the Pressure Equipment Directive PED 97/23/EC and are classified in Category IV.

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INTRODUCTION

Scope of Manual

This manual provides installation, startup, maintenance, and parts ordering information for the Types EZH and EZHSO pressure-reducing regulators and Type PRX pilot with Type SA/2 pilot supply filter regulator.

Information on other equipment used with this regulator is found in separate manuals.

Product Description

Types EZH and EZHSO regulators are accurate pilot-operated pressure balanced, soft-seated regulators. They are designed for use in high pressure natural gas transmission/city gate stations, large capacity distribution systems, and power plant feeds. They provide smooth, reliable operation, tight shutoff, and long life.

Type EZHSO "Spring-to-Open" version could be used when other overpressure protection options are foreseen, for example in a monitor configuration. In this case, in event of failure, the main regulator will stay completely open, allowing the monitor to take control. The monitor could be "Spring-to-Close" to ensure a double protection to downstream pipe.

Available Configurations:

- **Types EZH and EZHSO ("E Body")**

  Single regulator without slam shut

- **Types EZH and EZHSO ("X Body")**

  Single regulator in a X Body

  In case of modification made on a pressure equipment like cap replacement by a slam shut it's mandatory to comply to the local codes, rules and regulations. Contact us imperatively.

- **Types EZH OS2 and EZHSO OS2 ("X Body")**

  Single regulator with integrated slam shut

Pilot Description

Type PRX Pilot

The Types EZH and EZHSO pressure-reducing regulators can be equipped with a PRX Series pilot mounted on the main valve for pressure reducing or wide-open monitoring applications. The PRX Series pressure reducing pilots have the ability to handle a wide range of setpoints from 1 to 80 bar:

- **Type PRX/120:**

  Outlet pressure range of 1 to 40 bar. The Type PRX/120 can be used as the pilot on single stage pressure reducing regulators, as the monitor pilot, or as the working pilot in wide-open monitor systems.

- **Type PRX/120-AP:**

  Outlet pressure range of 30 to 80 bar. The Type PRX/120-AP can be used as the pilot on single stage pressure reducing regulators, as the monitor pilot, or as the working pilot in wide-open monitor systems.

- **Type PRX/125:**

  Identical to the Type PRX/120, except the restriction screw is removed. The Type PRX/125 can only be used as the monitor override pilot on working monitor applications.

- **Type PRX/125-AP:**

  Identical to the Type PRX/120-AP, except the restriction screw is removed. The Type PRX/125-AP can only be used as the monitor override pilot on working monitor applications.

- **Type SA/2 Pilot Supply Filter Regulator:**

  The Type SA/2 pilot supply filter regulator provides a constant pressure supply to the PRX Series pilot of 3 bar over the set pressure. The Type SA/2 has an integral 5-micron filter. For easy maintenance a block valve can be installed to separate the regulator from the pilot.

Regulator Options

- **Silencer (Figure 22)**

  The Type EZH silencer (Whisper III) is integrated in the regulator and is composed of a drilled cage.
  The Whisper III silencer is available for DN 25, 50, 80, and 100 and allows a noise attenuation up to 8dB.

- **Flow Coefficient Reduction (Figure 16)**

  The flow reduction is realised by replacement of the regulator standard seat by a reduction seat (key 2).

- **Type RPE Electrical Pilot Heater (Figure 25)**

  The Type RPE is used for reheating the gas supplying pressure reducing regulator pilots. The Type RPE avoids the inconveniences caused by freezing which can occur during high pressure drops.

Actuator

The actuator is an integral pressure type. All pressure parts are designed to resist up to 100 bar. The diaphragm is strong and can resist to a differential of 100 bar.

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CHARACTERISTICS

Table 1. *General Characteristics for Types EZH and EZHSO Regulator*

OPERATING PRESSURE		
A352LCC Body, Actuator, Valve, Pilot Body, Slam shut	PS	100 bar max
Associated BMS(1), according to size	PSD	10 to 100 bar
Type	IS	Integral strength(4)
OPERATING TEMPERATURE(2)	TS	-20 / 60°C Class 2
Sizes available	DN	25, 50, 80, and 100
Noise level reduction	Up to 8 dB	
REGULATOR		
European EN Standard		EN 334
Inlet Pressure	Pu	2 to 100 bar
Outlet Pressure	Pd	1 to 80 bar
Minimum Differential	ΔP min	1 bar (Type EZH) 3.8 bar (Type EZHSO)
Maximum Differential	ΔP max	99 bar (Type EZH) 96.2 bar (Type EZHSO)
Accuracy (optimal)	AC	See Table 2
Lock-Up Pressure Class	SG	Up to 5%(3)
Lock-Up Pressure Zone Class	SZ	Up to 5%(3)

(1) BMS - Safety Manometric Box
(2) Standard version
(3) Contact us with your operating conditions
(4) Depending on BMS configuration for Type EZH OS2

SLAM SHUT			
European EN Standard			EN 14382
Operation Class			A or B (see Figure 3)
Maximum Operating Differential		ΔP max	100 bar
Response Time		ta	<1 s
Accuracy	**Diaphragm, Bellows**	AG	Up to ±2.5%
	Piston		Up to ±5%
Set Pressure Range		Wdu-Wdo	0.010 / 100 bar
Flow Coefficient		Q_t	13
Internal Automatic Bypass		C_g	25
Rearming	Manual after rectification of fault		
Position Indicator	On mechanism box		
Fluid			
Groups 1 and 2 according to PED 97/23/EC, Gas 1st and 2nd family according to EN 437, or other gases (compressed air, nitrogen). **The gas must be non corrosive, clean** (filtration on inlet side necessary) **and dry.**			

Table 2. *Outlet Pressure Ranges, Accuracy Class, and Pilot Spring Information*

TYPE	OUTLET PRESSURE ADJUSTMENT RANGES (bar)	AC (ACCURACY CLASS)		PILOT CONTROL SPRING INFORMATION
		TYPE EZH	TYPE EZHSO	Spring Colour
PRX/120 and PRX/125	1.0 to 1.8	2.5%	2.5%	Yellow
	1.8 to 3.0	2.5%	2.5%	Green
	3.0 to 5.5	2.5%	2.5%	Blue
	5.5 to 8.5	2.5%	2.5%	Black
	8.5 to 14.5	1%	2.5%	Silver
	14.5 to 23.0	1%	2.5%	Gold
	23.0 to 30.0	1%	2.5%	Aluminium
	30.0 to 40.0	1%	2.5%	Red
PRX/120-AP and PRX/125-AP	30.0 to 80.0	1%	2.5%	Clear

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Table 3a. *2:1 Line Flow Coefficients, Regulator, and Slam-Shut Travel*

TYPES EZH (DN 25 - 100) AND EZHSO (DN 25 - 100)									
	REDUCTION	WITH SLAM SHUT (X BODY)				WITHOUT SLAM SHUT (E BODY)			
		DN 25	DN 50	DN 80	DN 100	DN 25	DN 50	DN 80	DN 100
Q_f	0	284	1078	2247	3567	280	1088	2266	3696
	1	210	908	1684	2969	218	829	1698	2902
	2	126	671	1058	1763	128	607	1066	1784
	3	79	385	685	1062	81	370	690	1072
C_g	0	550	2092	4359	6920	544	2110	4396	7170
	1	408	1762	3266	5760	423	1609	3294	5630
	2	245	1301	2052	3420	249	1177	2069	3460
	3	154	746	1328	2060	157	718	1339	2080
C_1	0	31.3	38.3	30.8	32.5	35.5	33.5	30.8	31.4
	1	34.3	35.3	33.9	35.3	38.7	31.9	33.9	34.2
	2	33.6	38.8	37.8	37.3	39.7	35.6	37.8	36.3
	3	32.1	40.8	33.6	37.1	39.1	38.2	33.6	37.3
Regulator travel (mm)		9	17	25	30	9	17	25	30
Slam-shut travel (mm)		15		30	50				

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Table 3b. *2:1 Line Flow Coefficients, Regulator with Integrated Whisper III Silencer*

TYPES EZH (DN 25 - 100) WITH WHISPER III AND EZHSO (DN 25 - 100) WITH WHISPER III									
	REDUCTION	SLAM SHUT INTEGRATED (X BODY)				WITHOUT SLAM SHUT (E BODY)			
		DN 25	DN 50	DN 80	DN 100	DN 25	DN 50	DN 80	DN 100
Q_f	0	223	781	1693	2742	255	793	1708	2789
	1	215	764	1418	2479	209	716	1172	2438
	2	140	603	975	1644	127	566	984	1711
	3	87	370	685	1041	81	358	690	1057
C_g	0	433	1516	3285	5320	495	1539	3313	5410
	1	417	1482	2751	4810	406	1389	2774	4730
	2	273	1169	1892	3190	247	1099	1908	3320
	3	168	718	1328	2020	158	695	1339	2050
C_1	0	35.5	37	30.8	31.7	33.8	33.5	30.8	30.4
	1	35.4	37.5	33.6	34.1	39.4	34.1	33.6	32.4
	2	32.3	39.5	37.1	36.4	39.9	35.7	37.1	35.7
	3	32.9	39.4	38.3	37.6	39.9	37.7	38.3	37.3

Table 4. *Failure Mode Analysis*

PART NAME	FAILURE (WORST CASE)	CAUSE OF FAILURE	EFFECT	REGULATOR TYPE	REGULATOR REACTION MODE	
Filter	Filter blocked/ clogged	Debris or aromatics present in the gas	Decrease of feeding pressure gives decrease of motorization pressure	EZHSO	Open	---
				EZH	---	Close
Pilot Disk	Pilot cannot be closed	Debris or aromatics present in the gas	Increase motorization pressure	EZHSO	Open	---
				EZH	Open	---
Pilot Lower Diaphragm	Pilot cannot control	Debris or aromatics present in the gas	Decrease motorization pressure	EZHSO	Open	---
				EZH	---	Close
Pilot Upper Diaphragm	Pilot cannot feed the regulator	Debris or aromatics present in the gas	Decrease motorization pressure	EZHSO	Open	---
				EZH	---	Close
Regulator Diaphragm	Not proper performance of the motorization pressure chamber	Debris or aromatics present in the gas	Balancing of pressures and charge or discharge of the motorization pressure chamber	EZHSO	Open	---
				EZH	---	Close
Pilot	Frozen Pilot, Type SA/2 working	Moisture in the gas, high pressure drop	Type SA/2 loading upper casing of regulator, Pilot not supplying loading pressure to lower casing	EZHSO	---	Close
				EZH	---	Close

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Connections

Inlet/Outlet :	CL150 RF - CL300 RF - CL600 RF PN 16B - PN 25B - PN 40B *Other configurations available (contact factory)*
Pilot feed:	1/4'' NPT female
Pilot Reject:	1/4'' NPT female
Pilot impulse:	1/4'' NPT female
Slam-shut impulse:	1/4'' NPT female
BM* vent:	1/4'' NPT female
Impulse tube diameter:	Interior Ø 8/10 mm
Contact switch:	See NTAOS2

* BM - Mechanism Box

Material

Body:	Steel
Connecting parts and bottom:	Steel
Actuator:	Steel
Regulator/Slam-shut orifice:	Stainless steel
Regulator valve plug:	Stainless steel
Slam-shut valve plug:	Stainless steel
Regulator plug disc/ Slam-shut O-rings:	Nitrile (NBR) or Fluorocarbon (FKM)

LABELLING

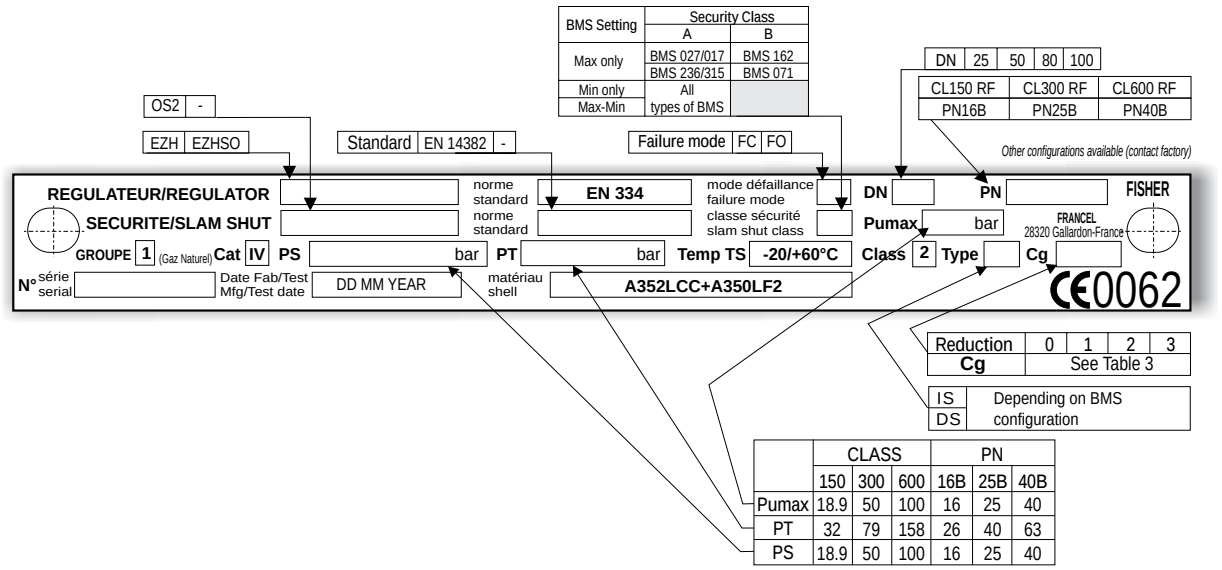

Figure 3. *Types EZH OS2 and EZHSO OS2 Label (X Body)*

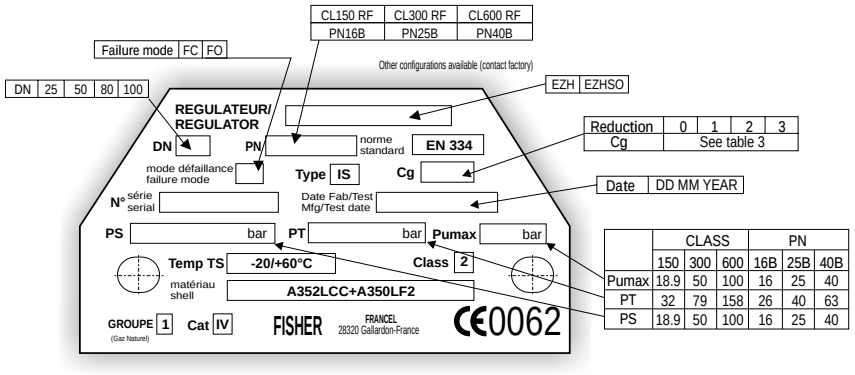

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Figure 4. *Types EZH and EZHSO Label (E Body)*

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DIMENSIONS AND WEIGHTS

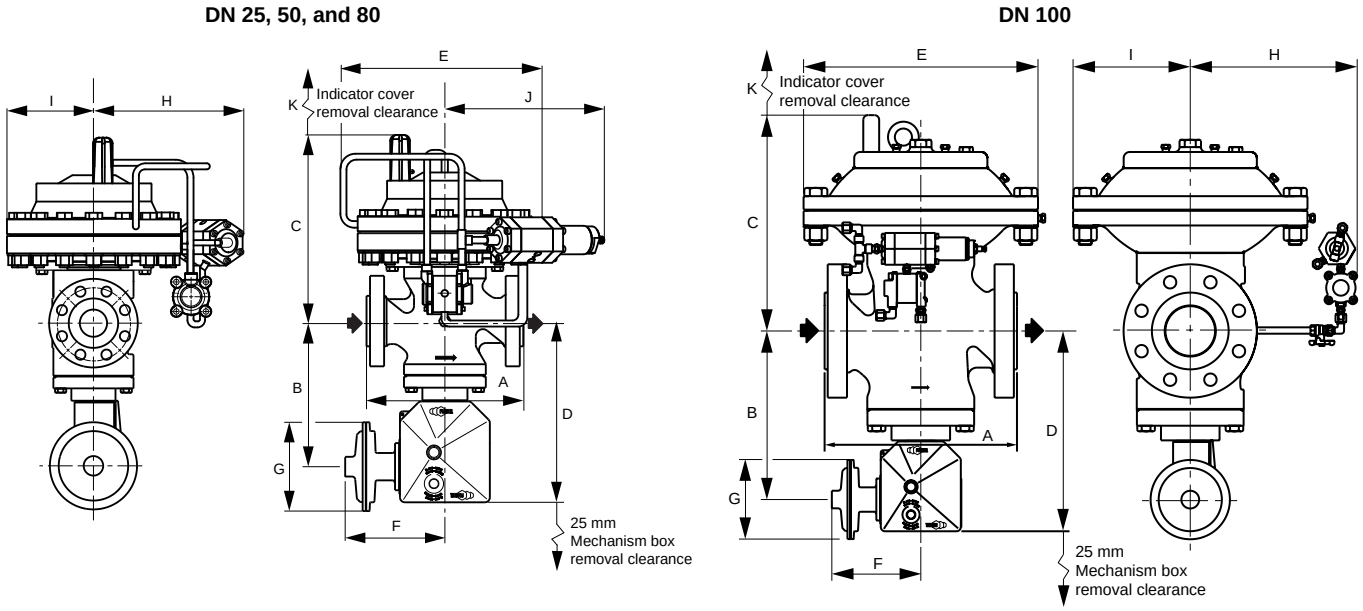

Figure 5. *Dimensions — Types EZH OS2 and EZHSO OS2 (Horizontal Position)*

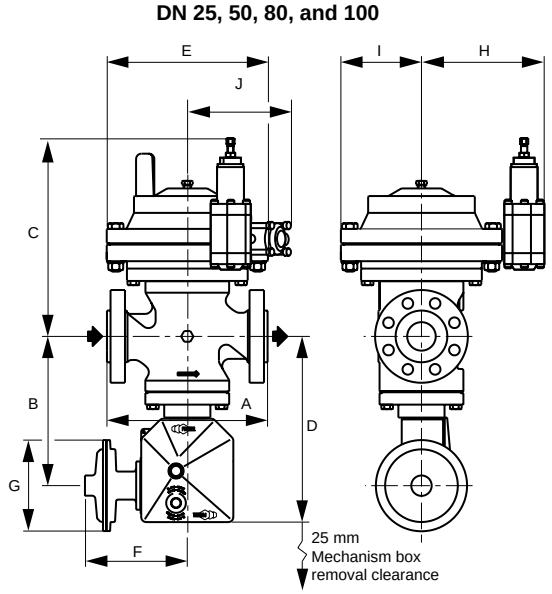

Figure 6. *Dimensions — Types EZH OS2 and EZHSO OS2 (Vertical Position)*

Table 5. *Approximate Regulator Weights Types EZH OS2 and EZHSO OS2*

DN	WEIGHTS (kg)		
	CL150/PN 16B	CL300/PN 25B/PN 40B	CL600
25	49	50	51
50	81	83	85
80	168	175	177
100	237	250	265

For Type EZHSO OS2 version add 1 kg

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Table 6a*. Dimensions — Types EZH OS2 and EZHSO OS2*

DN	OVERALL DIMENSIONS (mm)					
	F			G		
	Diaphragm	Piston	Bellows	Diaphragm	Piston	Bellows
25	181	204	223	162	71	74
50						
80						
100						

Table 6b*. Dimensions — Types EZH OS2 and EZHSO OS2*

DN	MAXIMUM OVERALL DIMENSIONS (mm)																
	A						B	C		D	E	H		I	J		K
	CL150	CL300	CL600	PN 16B	PN 25B	PN 40B		Type PRX Horizontal	Type PRX Vertical			Type PRX Horizontal	Type PRX Vertical		Type PRX Horizontal	Type PRX Vertical	
25	184	197	210	193.5			250	290	310	315	320	260	250	113	280	190	38
50	254	267	286	254	267		265	320	320	330	380	310	310	144	270	190	
80	298	317	337	310	317		301	400	400	366	500	390	390	200	270	270	51
100	352	368	394	350	368		345	442	427	410	580	394	394	240		140	

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DN 25, 50, and 80

DN 100(1)

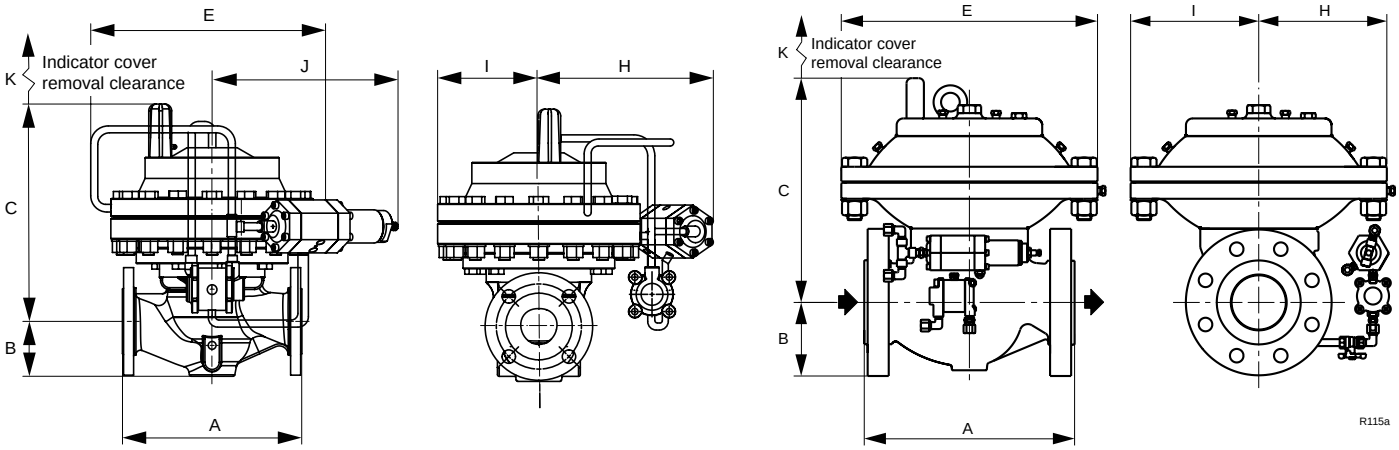

Figure 7. *Dimensions — Types EZH and EZHSO (Horizontal Position)*

DN 25, 50, 80, and 100

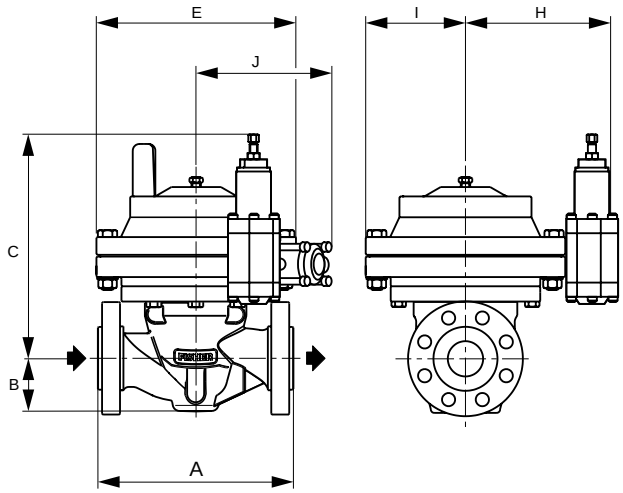

Figure 8. *Dimensions — Types EZH and EZHSO (Vertical Position)*

Table 7*. Approximate Regulator Weights Types EZH and EZHSO(1)*

DN	WEIGHTS (kg)		
	CL150/PN 16B	CL300/PN 25B/PN 40B	CL600
25	38	39	40
50	71	74	75
80	145	151	153
100	211	224	239

(1) For Type EZHSO version add 1 kg

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Table 8*. Dimensions — Types EZH and EZHSO*

DN	MAXIMUM OVERALL DIMENSIONS (mm)														
	A						B	C		E	H		I	J		K
	CL150	CL300	CL600	PN 16B	PN 25B	PN 40B		Type PRX Horizontal	Type PRX Vertical		Type PRX Horizontal	Type PRX Vertical		Type PRX Horizontal	Type PRX Vertical	
25	184	197	210	193.5			62	290	310	320	260	250	113	280	190	38
50	254	267	286	254	267		83	320	320	380	310	310	144	270	190	
80	298	317	337	310	317		105	400	400	500	390	390	200	270	270	51
100	352	368	394	350	368		137	442	427	580	394	394	240		140	

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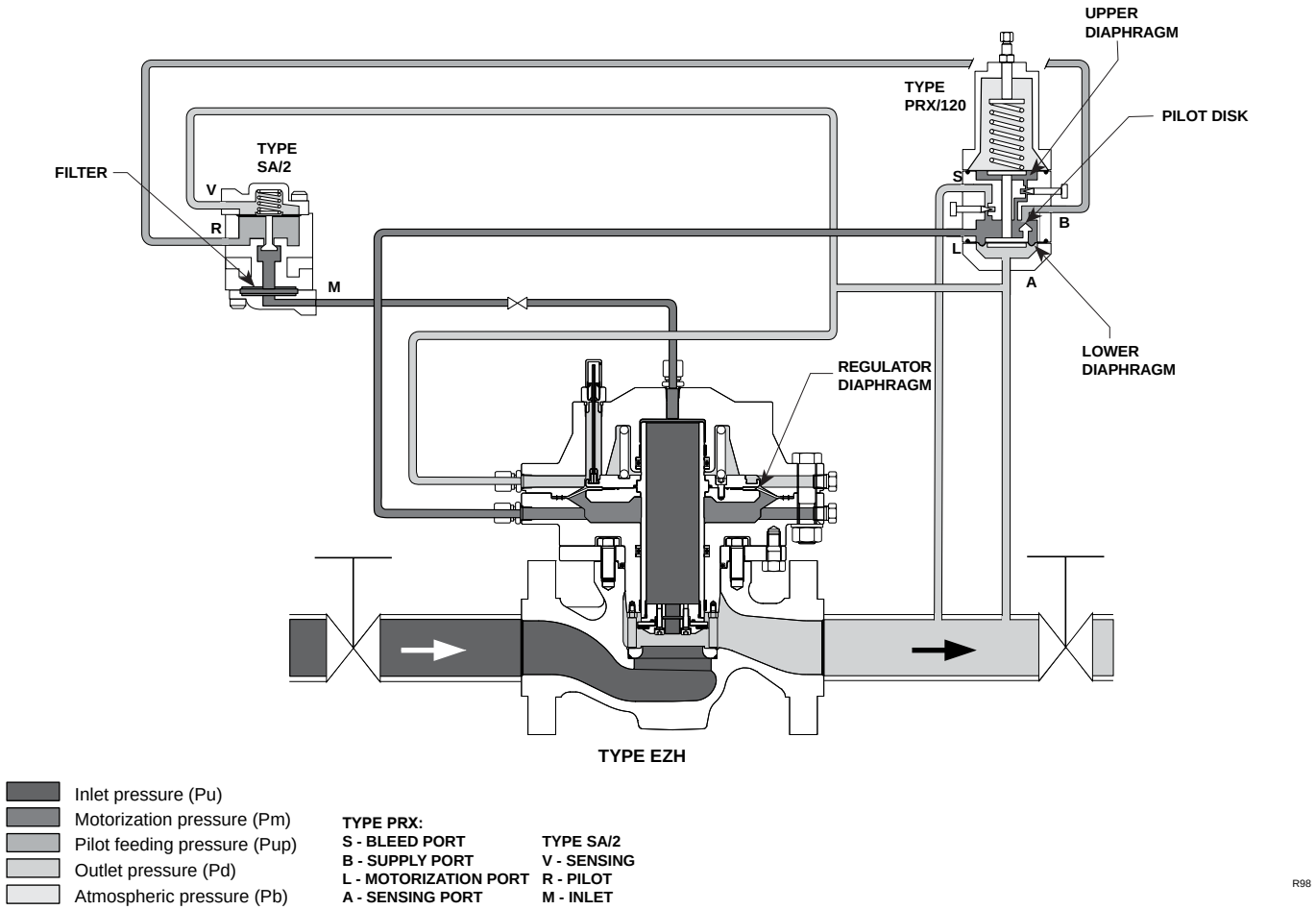

Figure 9. *Type EZH DN 25/50/80 (Spring-to-Close Version) Operational Schematic*

DESCRIPTION

The Types EZH and EZHSO regulators consist of:

- **Version without Integral Slam-Shut Valve:**
  - An "E Body" or an "X Body plus a cap"
  - A compensation valve, an interchangeable orifice
  - An actuator with position indicator
  - A pilot system adapted to the required pressure setpoint
- **Version with Integral Slam-Shut Valve:**
  - Same parts and sub-assemblies as in the version without slam shut
  - An "X Body"
  - A valve with tight shut-off O-ring
  - An automatic slam-shut bypass
  - A release relay Type OS2 (see instruction manual NTAOS2) consisting of:
    - A mechanism box (BM)
    - A safety manometric box (BMS) connected to the outlet side of the regulator

PRINCIPLE OF OPERATION

Type EZH — Spring-to-Close Version

Type EZH Single-Pilot Regulator (Figures 9 and 10)

The pilot-operated Type EZH uses inlet pressure as the operating medium, which is reduced through pilot operation to load the actuator diaphragm. Outlet pressure (Pd) opposes the motorization pressure (Pm) in the actuator and also opposes the pilot control spring.

When the outlet pressure (Pd) drops below the setting of the pilot control spring, pilot control spring force on the pilot diaphragm thus opens the pilot valve plug, providing additional motorization pressure (Pm) to the actuator diaphragm. This diaphragm motorization pressure opens the main valve plug, supplying the required flow to the downstream system.

Any excess motorization pressure on the actuator diaphragm escapes downstream through the bleed restriction in the pilot.

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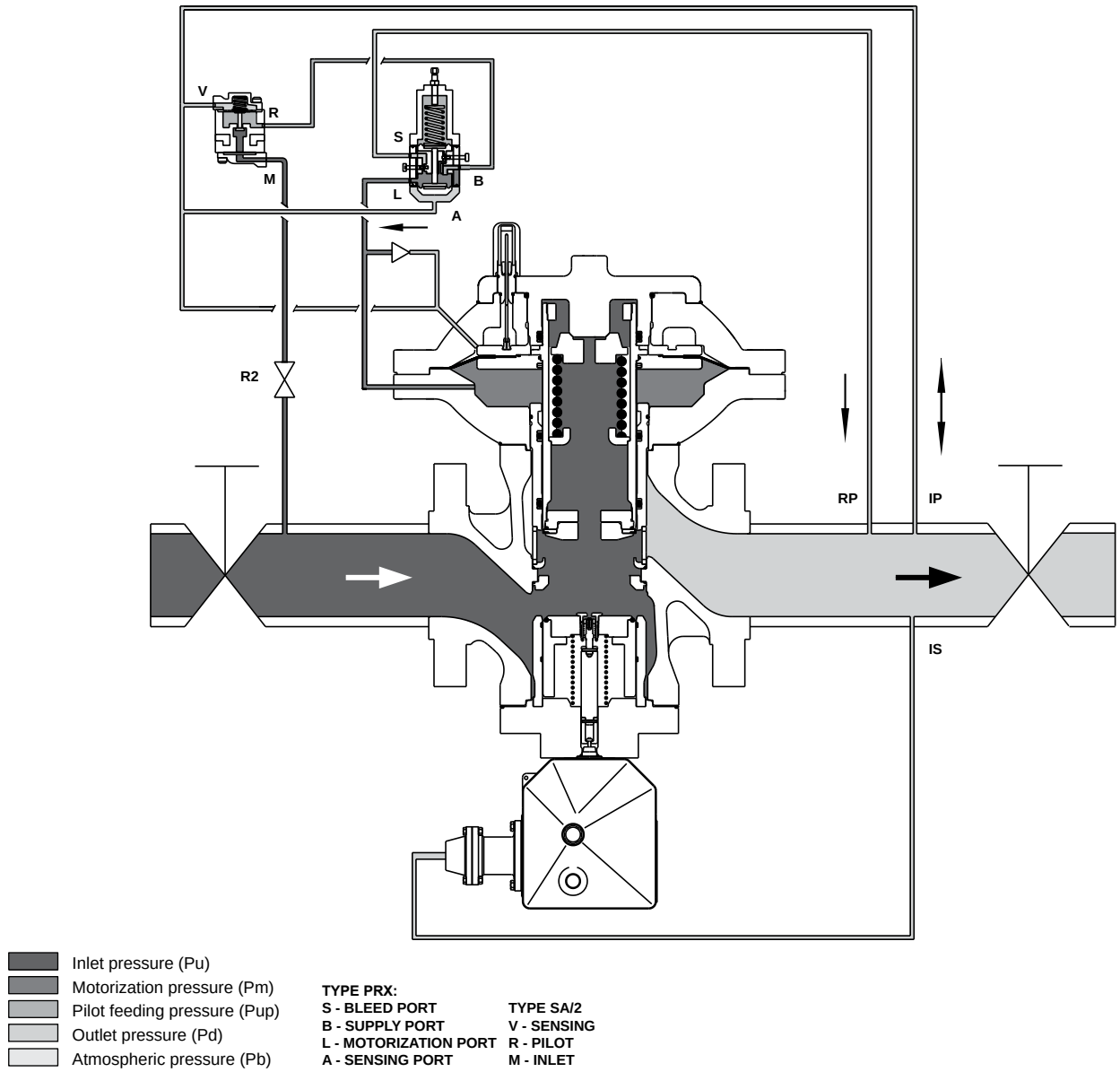

Figure 10. *Type EZH-OS2 DN 100 (Spring-to-Close Version) Operational Schematic*

When the gas demand in the downstream system has been satisfied, the outlet pressure (Pd) increases. The increased pressure is transmitted through the downstream control line and acts on the pilot diaphragm. This pressure exceeds the pilot spring setting and moves the Type PRX diaphragm, closing the Type PRX orifice and interrupting the motorization pressure supply to main valve actuator.

The excess of motorization pressure (Pm) acting on both the main diaphragm and Type PRX pilot bleeds to the downstream system through a bleed restriction in the pilot.

For Type EZH DN 100 a check valve (Figure 26) is installed between outlet pressure and motorization pressure impulse lines; this valve will protect the diaphragm assembly from wrong procedures during startup, avoiding a too high pressure differential between outlet and motorization pressure.

Type EZHSO — Spring-to-Open Version

Type EZHSO Single-Pilot Regulator (Figures 11 and 12)

CAUTION

The pilot-operated Type EZHSO (Spring-to-Open version) will fail in open position in case of main valve diaphragm failure or lack of pressure supply to the pilot (see Table 4 for Failure Mode Analysis).

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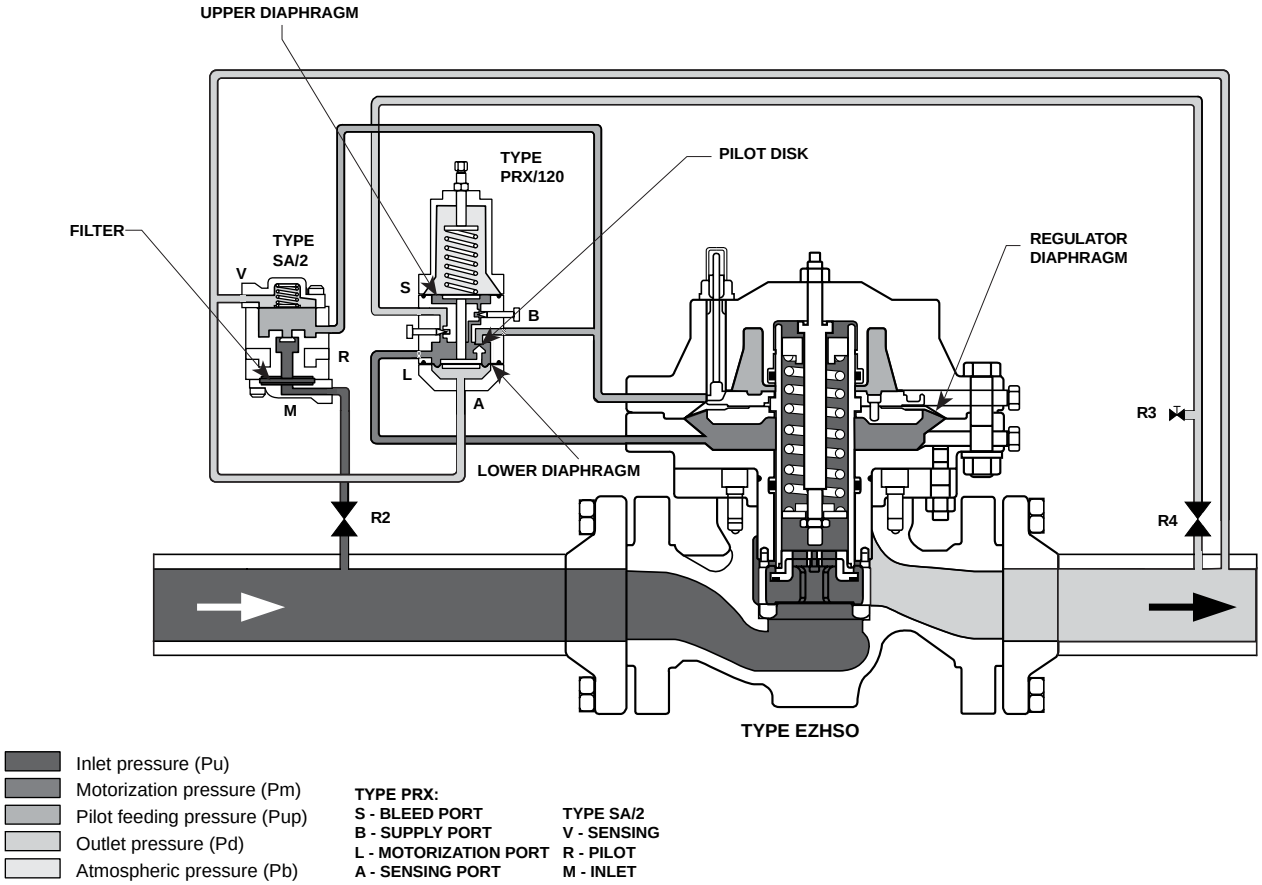

Figure 11. *Type EZHSO DN 25/50/80 (Spring-to-Open Version) Operational Schematic*

Type EZHSO uses inlet pressure as the operating medium, which is reduced through pilot operation to load the actuator diaphragm (lower chamber). The upper case of Type EZHSO actuator is filled with pressure coming from pre-regulator Type SA/2, which reduces inlet pressure (Pu) to the constant value of outlet pressure plus approximately 3 bar. This pressure opposes the main spring force that tends to open the regulator. Outlet or downstream pressure (Pd) opposes the pilot control spring. When outlet pressure drops below the setting of the pilot control spring, pilot control spring force on the pilot diaphragm opens the pilot valve plug, providing additional motorization pressure (Pm) to the actuator diaphragm.

This diaphragm motorization pressure opens the main valve plug, supplying the required flow to the downstream system. Any excess motorization pressure on the actuator diaphragm escapes downstream through the bleed restriction in the pilot.

When outlet pressure increases over the setting of the pilot spring, the pilot valve plug will be closed reducing motorization pressure to the actuator diaphragm; the pressure in the upper case will force the regulator to close.

For Type EZHSO DN 100 a check valve (Figure 26) is installed between outlet pressure and loading pressure impulse lines; this valve will protect the diaphragm assembly from wrong procedures during startup, avoiding a too high pressure differential between outlet and motorization pressure.

EZH and EZHSO Series Adjustment

The adjustment of the regulator is performed by means of the pilot adjusting screw, which causes variation of the compression of the control spring.

Adjustment is performed while the regulator is in operation with the aid of a pressure gauge to monitor downstream pressure.

The shut-off valve downstream of the regulator must not be completely closed, it is necessary that a small quantity of gas flows downstream to allow the outlet side to vent when it is necessary to lower the pressure.

Loosen the Type PRX pilot locknut and turn the adjusting screw slowly clockwise to increase outlet pressure and counterclockwise to decrease outlet pressure. Use a pressure gauge to monitor the outlet pressure until the desired pressure is reached. No adjustment is needed to the Type SA/2 stabilizer filter.

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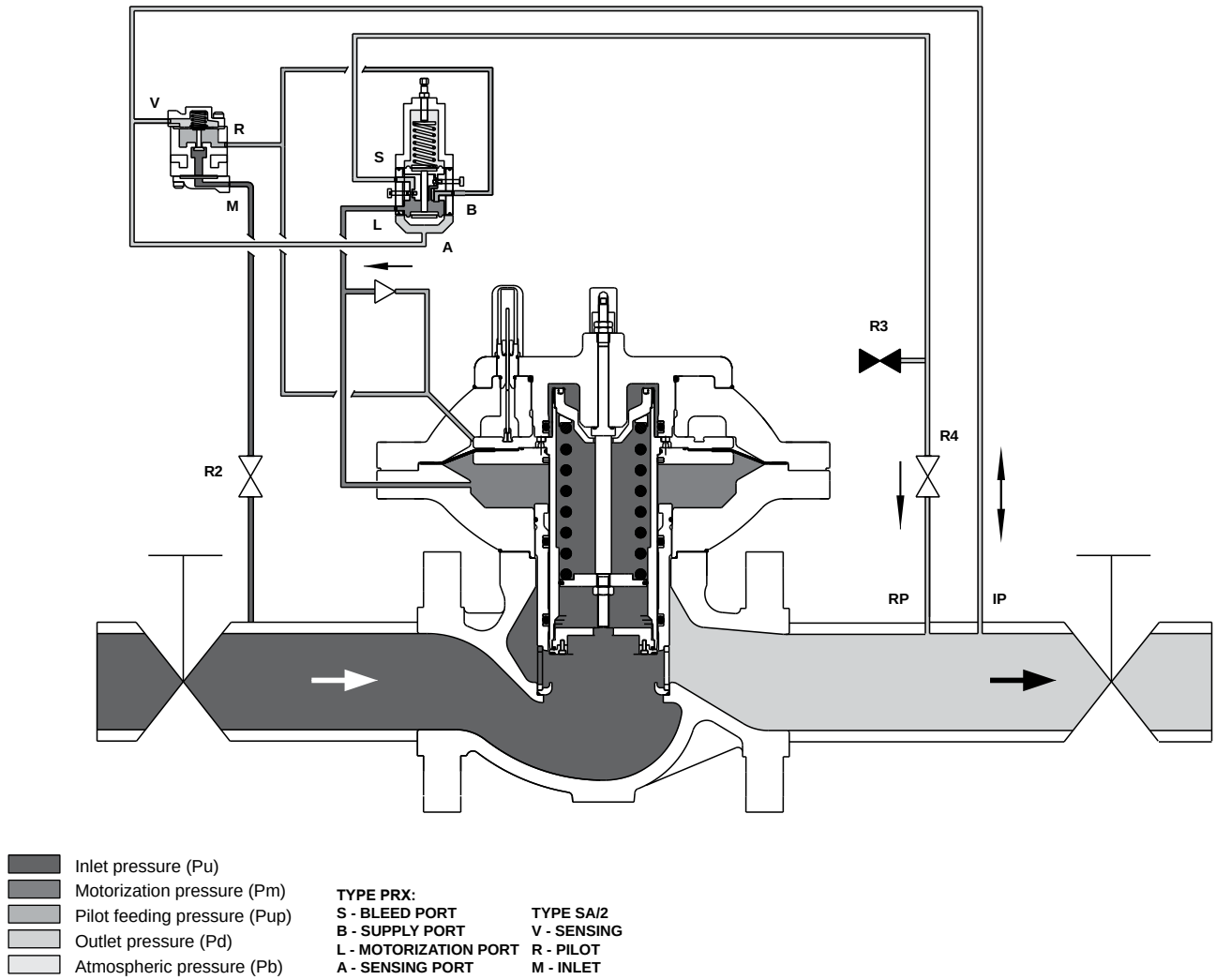

Figure 12. *Type EZHSO DN 100 (Spring-to-Open Version) Operational Schematic*

MONITORING SYSTEMS

Monitoring regulation is overpressure protection by containment, therefore, there is no relief valve to vent to the atmosphere. When the working regulator fails to control the pressure, a monitor regulator installed in series, which has been sensing the downstream and control pressure, goes into operation to maintain the downstream pressure at a slightly higher level than normal pressure. During an overpressure situation, the monitoring system keeps the customer on line.

Also testing is relatively easy and safe. To perform a periodic test on a monitoring regulator, increase the outlet set pressure of the working regulator and watch the outlet pressure to determine if the monitoring regulator takes over at the appropriate outlet pressure.

Wide-Open Monitoring Systems

In normal operation of a wide-open configuration, the working regulator controls the system's outlet pressure. With a higher outlet pressure setting, the monitor regulator senses a pressure lower than its setpoint and tries to increase outlet pressure by going wide open. If the working regulator fails, the monitoring regulator assumes control and holds the outlet pressure at its outlet pressure setting.

Figure 13 shows an upstream wide-open monitor Type EZH (Spring-to-Close) and a downstream active regulator Type EZHSO (Spring-to-Open). With this configuration, in case of regulator main diaphragm failure, it will fail in open position letting the monitor work properly; in case of monitor main diaphragm failure, it will fail in close position guaranteeing a protection against overpressure to downstream system.

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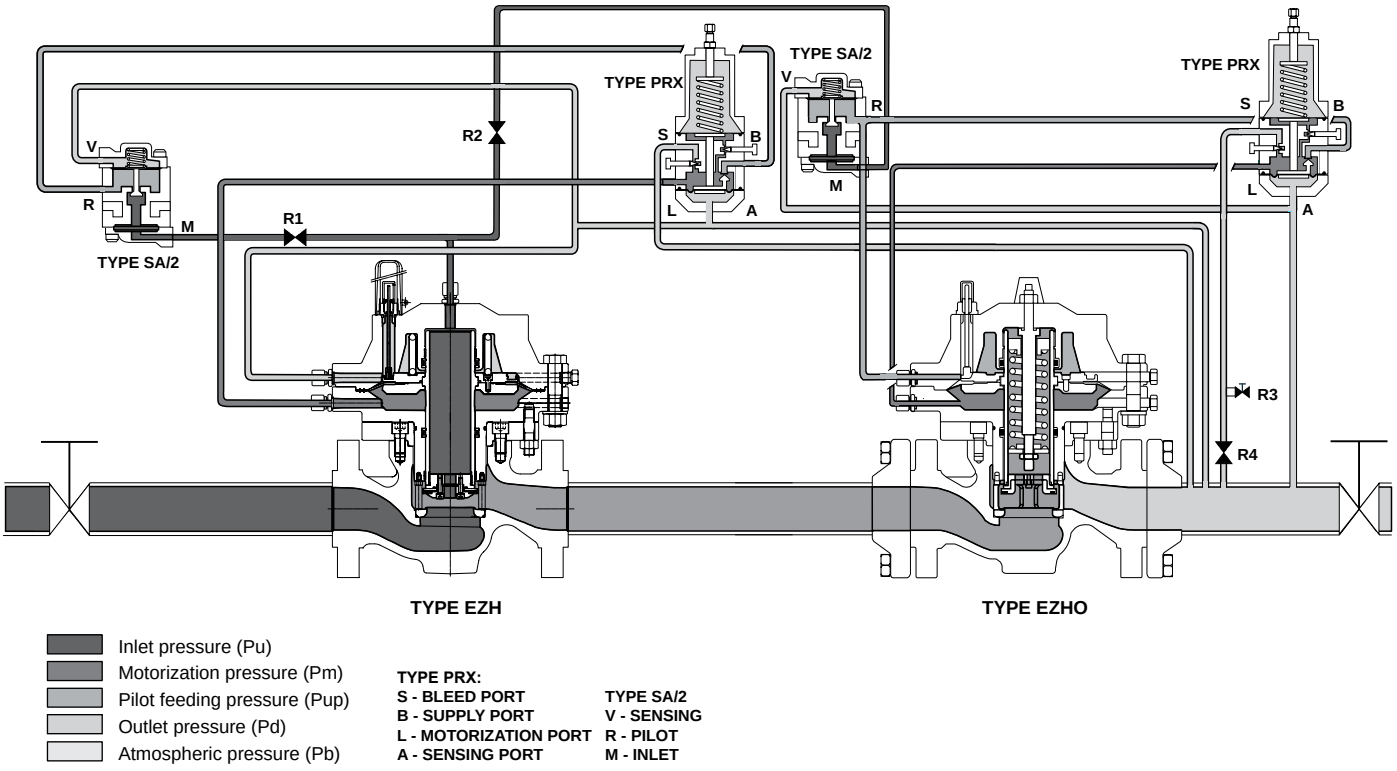

Figure 13. *Upstream Wide-Open Monitoring System Operational Schematic for DN 25, 50, and 80*

The schematic from Figure 13 represents the configuration for the DN 25, 50, and 80, for the DN 100 the schematic remains the same with the remark that a check valve (Figure 26) must be installed between outlet pressure and loading pressure impulse lines of the regulator and wide open monitor as well.

Working Monitor System with PRX Pilot (Figure 14)

In a working monitoring system, the upstream regulator requires two pilots and it is always the monitoring regulator. The additional pilot PRX/125 or PRX/125-AP permits the monitoring regulator to act as a series regulator to control an intermediate pressure during normal operation. In this way, both units are always operating and can be easily checked for proper operation.

In normal operation, the working regulator controls the outlet pressure of the system. The monitoring regulator's working pilot Type PRX/120 or PRX/120-AP controls the intermediate pressure and the monitor pilot Type PRX/125 or PRX/125-AP senses the system's outlet pressure. If the working regulator fails, the monitoring pilot Type PRX/125 or PRX/125-AP will sense the increase in outlet pressure and take control.

CAUTION

The working regulator must be rated for the maximum allowable operating pressure of the system because this will be its inlet pressure if the monitoring regulator fails. Also, the outlet pressure rating of the monitoring pilot Type PRX/125 or PRX/125-AP and any other components that are exposed to the intermediate pressure must be rated for full inlet pressure.

Working monitor installations require a Type EZH or EZHSO main valve with a Type PRX/120 or PRX/120-AP working pilot, a Type PRX/125 or PRX/125-AP monitoring pilot for the upstream regulator, and a Type EZH or EZHSO with the appropriate Type PRX/120 or PRX/120-AP pilot for the downstream regulator.

Adjusting the monitor regulator is the same as adjusting the main regulator. Monitor setpoints are set slightly higher than the main regulator. However, the value of this difference cannot be determined in advance, as it depends on the particular characteristics of each application.

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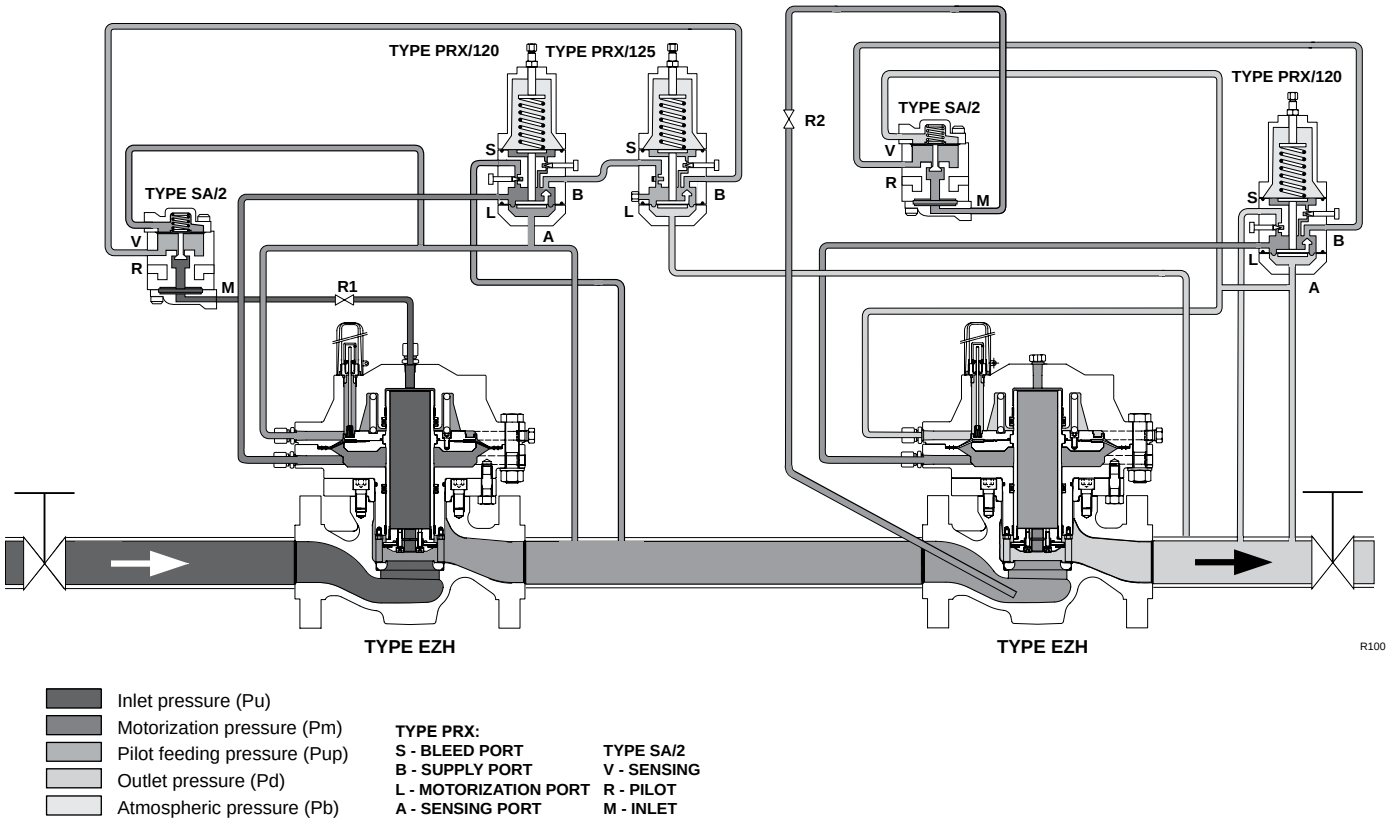

Figure 14. *Working Monitoring System Operational Schematic with Two EZH (Spring-to-Close) for DN 25, 50, and 80*

The schematic from Figure 14 represents the configuration for the DN 25, 50, and 80, for the DN 100 the schematic remains the same with the remark that a check valve (Figure 26) must be installed between outlet pressure and loading pressure impulse lines of the regulator and working monitor as well.

INSTALLATION

⚠ WARNING

Personal injury or equipment damage, due to bursting of pressure-containing parts may result if this regulator is overpressured or is installed where service conditions could exceed the limits given in the characteristics section and on the appropriate nameplate, or where conditions exceed any rating of the adjacent piping or piping connections. To avoid such injury or damage, provide pressure-relieving or pressure-limiting devices to prevent service conditions from exceeding those limits. Also, be sure that installation is in compliance with all applicable code and regulations.

Physical damage to the regulator can break the pilot off the main valve, causing personal injury and property damage due to bursting of pressure-containing parts. To avoid such injury and damage, install the regulator in a safe location.

Only personnel qualified through training and experience should install, operate, and maintain a regulator.

Before installation, make sure that there is no damage to, or debris in the regulator.

Make sure that all tubing and piping are clean and unobstructed.

The regulator must be installed on horizontal pipeline. For the version with slam shut, the release relay must be situated towards the bottom.

Installation according to EN 12186 is recommended.

When assembling with adjacent elements take care not to create pressure force on the body. The assembling elements (bolts, O-rings, flanges) should be compatible with the geometry and working conditions of the equipment. If the case arises a support must be used to avoid pressure force on the body (a support can be installed under the flanges).

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Connect the actuator to the impulse plug keeping a minimum distance of 4 x D to a straight run of the outlet pipe.

In the version with integrated slam shut connect the safety manometric box (BMS) to the outlet pipe keeping a minimum distance of 4 x D to a straight run of the pipe.

In the case of functioning class B for the slam shut it is necessary to regularly check the safety manometric box (BMS) diaphragm.

Connect the reject tab to the outlet pipe.

It is recommended to separate the slam-shut impulse from that of the actuator. Do not connect impulses on the lower generator line.

It is recommended to install and isolation tap and a vent tap. These can be useful for slam-shut settings and verifications.

Check that the pilot impulse is connected and in the case of an isolating tap (not recommended) that it is open.

No modification should be made to the structure of the equipment (drilling, grinding, soldering...).

It is recommended to install a servicing valve on the outlet pipeline to facilitate adjustments and bleeding off to the atmosphere.

In the version with integral slam shut, verify that the safety manometric box (BMS) and spring correspond to the appropriate operating conditions on the outlet side of the regulator.

The equipment should not receive any type of shock, especially the release relay.

The user should verify or carry out a protection adapted to the environment.

For DN 25 to 80, use long screws or threaded stems when opening the actuator (warning compressed spring).

The action of fire, seismic and lightening are not taken into consideration in standard regulators. If required, a special product selection and/or specific calculations may be supplied according to specific requirements.

A regulator may vent some gas to the atmosphere. In hazardous or flammable gas service, vented gas may accumulate, causing personal injury, death, or property damage due to bursting of pressure-retaining parts.

Vent a regulator in hazardous gas service to a remote, safe location away from air intakes or any hazardous location. The vent line or stack opening must be protected against condensation or clogging.

All Installations (Single Regulator or Monitor Systems)

A Type EZH or EZHSO regulator bleeds no gas to atmosphere during normal operation, thus making the regulator suitable for installation in pits and other enclosed locations without elaborate venting systems.

This regulator can also be installed in pits subject to flooding by venting the pilot spring case above the expected flood level so that the pilot setting can be referenced to atmospheric pressure.

1. Install the regulator so that the flow arrow on the main valve matches the flow direction of process fluid through the regulator.
2. Apply pipe compound to the male pipeline threads before installing a regulator with threaded NPT end connections. Use gaskets between pipeline and regulator flanges when installing a regulator with flanged end connections. When installing buttweld end connections, remove trim before welding and make sure to use approved welding practices. Use approved piping procedures when installing the regulator.
3. Type PRX pilots have a 1/4-inch NPT vent connection in the spring case. To remotely vent gas from the spring case, remove the screened vent, and connect 1/4-inch piping or tubing to the spring case connection. The piping or tubing should vent to a safe location, have as few elbows as possible, and have a screened vent on it's exhaust. Install the regulator and any remote vent piping or tubing so that the vent is protected from condensation, freezing, or substances that my clog it.

CAUTION

To avoid freeze up due to pressure drop and moisture in the gas, use anti-freeze practices, such as heating the supply gas or adding a de-icing agent to the supply gas.

4. Connect the actuator to the downstream sense line on a straight run of outlet pipe 8/10 (inside diameter). Connect the other end of that impulse to the Type PRX port.
5. Connect the PRX pilot port to the outlet pipeline at a minimum distance of 4 x D from the regulator's outlet flange.
6. For Type EZHSO installation, a vent valve downstream of the regulator is needed. It should be installed directly in the Type PRX pilot bleed line connection (line from port "S" to pipe). A full bore NPS 1/4 ball valve for the vent line is preferred to provide sufficient flow.

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Wide-Open Monitor Regulator

1. Follow the procedures in the All Installations section, and then continue with step 2 of this section. The sense and bleed control lines of both the upstream and downstream pilots will be connected to the downstream piping (see Figure 13).
2. Connect the pilot supply line for the downstream regulator to the outlet "R" port of the Type SA/2 pilot supply filter regulator.

Working Monitor Regulator

1. Follow the procedure in the All Installations section, and then continue with step 2 of this section. The sense line of the upstream monitor pilot and the bleed and sense lines of the downstream pilot will be connected to the downstream piping (see Figure 14).
2. Connect an inlet supply line from the upstream piping to the inlet "M" port of the downstream Type SA/2 pilot supply filter regulator.
3. Connect a control (sense) line from the "A" port of the upstream working Type PRX pilot to the intermediate pressure portion of piping, using 8/10 (inside diameter) tube.
4. Connect a downstream bleed line from the "S" port of the upstream working Type PRX pilot to the intermediate pressure portion of piping, using 8/10 (inside diameter) tube.

STARTUP AND ADJUSTMENT

Pre-startup Considerations

Each regulator is factory-set for the outlet pressure specified on the order. If no setting was specified, outlet pressure was factory-set at the mid-range of the pilot control spring. Before beginning the start-up procedure in this section make sure the following conditions are in effect:

- Block valves isolate the regulator
- Vent vales are closed
- A bypass, if any, is in operation.

In all cases, check the control spring setting to make sure it is correct for the application.

CAUTION

Be sure to slowly introduce pressure into the system to prevent downstream overpressure due to potential rapid pressure increase. Pressure gauges should always be used to monitor downstream pressure during startup. Procedures used in putting this regulator into operation must be planned accordingly if the downstream system is pressurized by another regulator or by a manual bypass.

TYPE EZH OS2 SLAM-SHUT VERSION

In the case of opening the mechanism box lid:

1. **After arming, never leave the key on the stem**
2. **Never put your fingers in or near the reset mechanism area**

Note

When using a Type SA/2 pilot supply filter regulator, the differential pressure across the regulator must be at least 3 bar for optimum regulator performance. The Type SA/2 can be removed if differential pressure across the regulator is less than 3 bar and inlet pressure stays at or below 13.8 bar.

Startup

Type EZH Startup:

1. Make sure all block valves, vent valves, and control line valve(s) are closed.
2. Back out the pilot adjusting screw(s).
3. **Slowly open** the valves in the following order:
   - Inlet block valves.
   - Pilot supply and control line valve(s), if used.
4. Crack open the outlet block valve or bypass valve to allow minimum flow.
5. After adjusting the Type PRX pilot(s) to the desired pressure setting(s), slowly open the downstream block valve wide open.
6. Close the bypass valve, if used.

Type EZHSO Startup:

1. Make sure all block valves, except valve R4, vent valves, and control line valve(s) are closed.
2. Back out the pilot adjusting screw(s).
3. Introduce upstream pressure by slowly opening inlet valve.
4. Slowly open valve R2.
5. Open valve R3.
6. Close valve R4, the regulator Type EZHSO close.
7. Open valve R4.
8. Close valve R3.
9. Slowly open downstream valve, making sure that there is a constant sufficient pressure drop across the regulator. If downstream pressure climbs too close to upstream pressure, the regulator will again fully open. In this case, start-up procedure needs to be repeated.

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For a single regulator, set the pilot to the desired outlet (control) pressure according to the Pilot Adjustment procedure.

For a wide-open downstream monitor installation, adjust the upstream working pilot until intermediate pressure is higher than the desired setpoint of the monitor pilot. Adjust the downstream monitoring pilot to the desired monitoring takeover pressure. Reduce the upstream pilot to the normal outlet pressure setting.

For a wide-open upstream monitor installation, adjust the downstream working pilot to a setpoint higher than the setpoint of the monitor pilot. Adjust the upstream monitoring pilot to the desired monitoring takeover pressure. Reduce the downstream pilot to the normal outlet pressure setting.

For a working monitor installation, adjust the setpoint of the upstream monitor pilot to the desired maximum pressure. Adjust the upstream working pilot to the desired intermediate pressure setting. Adjust the downstream pilot to a pressure setting slightly above the upstream monitor pilot pressure setting. Adjust the upstream monitor pilot to its desired setpoint. Establish final desired downstream pressure by adjusting the downstream working regulator pilot.

10. After adjusting the Type PRX pilot(s) to the desired pressure setting(s), slowly open the downstream block valve wide open.
11. Close the bypass valve, if used.

Type OS2 Manometric Box Set Point Verification Procedure

Using the vent valve supply a pressure equal to the set pressure foreseen for the regulator.

- 1st release relay stage
  - → Set (Stage 1)
- Slam-shut valve plug
  - → Open (Stages 2 and 3)
  - → Progressively increase the pressure until tripping occurs
  - → Adjust setting if necessary (NTAOS2). Note the set point value on the equipment or mark it on a commissioning document

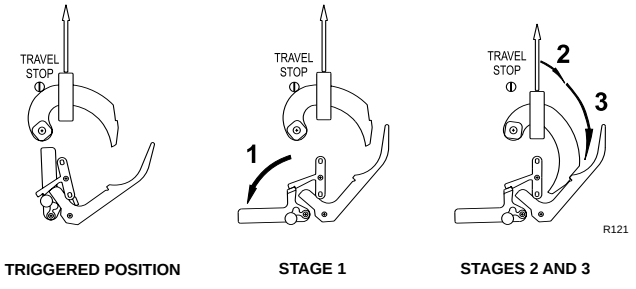

***Figure 15**. Setpoint Verification Phase*

Type PRX Pilot Adjustment

To adjust a standard Type PRX pilot, loosen the locknut, and turn the adjusting screw.

Turning the adjusting screw clockwise into the spring case increases the spring compression and pressure setting. Turning the adjusting screw counter clockwise decreases the spring compression and pressure setting

When the required pressure setting is maintained for several minutes, tighten the locknut to lock the adjusting screw in position.

Type PRX Pilot Restrictor and Damper Screw Adjustment

Note

Recommended initial setting of the restrictor screw is turned completely in (clockwise) and then turned out 1/2 turn. The damper screw initial setting is turned completely out (counter clockwise).

The Type PRX/125 (upstream monitor pilot in working monitor installations) does not have a restrictor screw.

The restrictor screw of the Type PRX pilot can be used if there is hunting of the set pressure. Slowly turning out the restrictor screw (counterclockwise) will help steady the set pressure.

Turning out the restrictor screw will slightly decrease set pressure, so adjustment of the pilot adjusting screw may be necessary.

The damper screw can be turned in (clockwise) to slow the response of the regulator. It is advisable that adjustment of the damper and restrictor screws be limited to 1/4 turn at a time to observe the response of the regulator(s).

SHUTDOWN

CAUTION

If the pilot bleed control line pressure is shut down first, the downstream system may be subjected to full inlet pressure (Pu).

1. If the pilot setting must be disturbed, be sure to keep some tension on the spring. This will prevent trapping inlet pressure during blow down.
2. Slowly close the valves in the following order:
   - Inlet block valve,
   - Outlet block valve,
   - Control line valve(s), if used.
3. Open the vent valves to depressurize the system.

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MAINTENANCE

For both Types EZH and EZHSO DN 100, never remove or disconnect the check valve installed between the two casings.

The regulator parts are subject to normal wear and must be inspected periodically and replaced as necessary.

The frequency of inspection and replacement depends on the severity of service conditions and on applicable codes and regulations.

Use silicone grease for O-rings and diaphragm, molybdenum graphite grease for spring and mechanical parts.

WARNING

To avoid personal injury or property damage from sudden release of pressure, isolate the regulator from the pressure system, and release all pressure from the pilot and main valve before performing maintenance operations.

CAUTION

Use proper lifting techniques, when lifting the upper and lower actuator casings (keys 11 and 5, Figure 16) off the body (key 1, Figure 16).

The actuator assembly weighs more than 45 kg.

Main Valve and Actuator Maintenance

Disk Maintenance DN 25, 50, and 80 (Figure 16)

Type EZH Disk Maintenance

1. Remove screws (key 24).
2. Carefully lift the upper actuator casing and lower actuator casing assembly (keys 11 and 5) off the body (key 1).
3. Remove the hex socket cap screws (key 33) and spring lock washers (key 32). Lift off the disk holder assembly (key 30) and disk retainer (key 31).
4. Remove the O-ring (key 29). Inspect the O-ring for damage or wear, and replace if necessary. Lightly lubricate O-ring before placing in the sleeve adaptor (key 27).
5. Remove the cage (key 3), seat ring (key 2) and O-ring (key 34). Inspect the O-ring for damage or wear, and replace if necessary. Lightly lubricate O-ring before placing in the body (key 1).
6. Set the seat ring (key 2) back in the body (key 1) with the curved side down and the seat edge up. To check O-ring (key 7), skip to the Intermediate Flange O-ring Maintenance section. Place the cage (key 3) on top of seat ring. The cage will engage the step on the seat ring.
7. Place the disk holder assembly (key 30) and disk retainer (key 31) on the sleeve adaptor (key 27).
8. Insert the spring lock washers (key 32) and hex socket cap screws (key 33) and tighten. See Torque Specification table for proper torque.
9. Carefully lift the upper actuator casing and lower actuator casing assembly (keys 11 and 5) and place on the body (key 1). Secure the screws (key 24). See Torque Specification table for proper torque.

Type EZHSO Disk Maintenance

1. Remove screws (key 24).
2. Carefully lift the upper actuator casing and lower actuator casing assembly (keys 11 and 5) off the body (key 1).
3. Remove the hex socket cap screw (key 154). Lift off the disk holder assembly (key 30).
4. Remove the O-ring (key 29). Inspect the O-ring for damage or wear, and replace if necessary. Lightly lubricate O-ring before placing in the sleeve adaptor (key 27).
5. Remove the cage (key 3), seat ring (key 2) and O-ring (key 34). Inspect the O-ring for damage or wear, and replace if necessary. Lightly lubricate O-ring before placing in the body (key 1). Do not attempt to remove the sleeve adaptor.
6. Set the seat ring (key 2) back in the body (key 1) with the curved side down and the seat edge up. To check O-ring (key 7), skip to the Intermediate Flange O-ring Maintenance section. Place the cage (key 3) on top of seat ring. The cage will engage the step on the seat ring.
7. Place the disk holder assembly (key 30) on the sleeve adaptor (key 27).
8. Insert the hex socket cap screw (key 154) and tighten. See Torque Specification table for proper torque.
9. Carefully lift the upper actuator casing and lower actuator casing assembly (keys 11 and 5) and place on the body (key 1). Secure the screws (key 24). See Torque Specification table for proper torque.

Disk Maintenance Type EZH DN 100 (Figure 17)

1. Remove screws (key 77).
2. Carefully lift the cap (key 70) off the upper casing (key 11) and unscrew the eye bolts (key 35) from the cap (key 70).

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3. Remove the O-ring (key 75). Inspect for damage or wear, and replace if necessary.
4. Remove the O-ring (key 69). Inspect for damage or wear, and replace if necessary. Lightly lubricate O-ring before placing inside cap (key 70).
5. Remove smart screws (key 68) from sleeve.
6. Fit eye bolt (key 35) into ring nut (key 73) threaded hole.
7. Carefully remove the trim system from the sleeve guide utilizing the eye bolt (key 35).
8. Remove the hex socket cap screws (key 33) and lock washers (key 32).
9. Lift off the disk retainer (key 31) and disk assembly (key 30). Inspect for damage or wear, and replace if necessary.
10. Remove the O-ring (key 29). Inspect the O-ring for damage or wear, and replace if necessary.
11. Place disk assembly (key 30) onto disk retainer (key 31).
12. Place disk retainer assembly into sleeve adapter (key 27) and align screw holes.
13. Place lock washer (key 32) on screws (key 33).
14. Screw together the disk retainer assembly into the sleeve adapter assembly. See Torque Specification table for proper torque.
15. Lubricate the sleeve (key 14).
16. Carefully insert the trim system into the sleeve guide (key 61) utilizing eye bolt (key 35). Align sleeve utilizing the socket head cap screw (key 74) as a guide.
17. Screw smart screws (key 68) to affix the sleeve system. See Torque Specification table for proper torque.
18. Remove eye bolt (key 35) from ring nut (key 73) threaded hole.
19. Carefully place the cap on the upper casing (key 11).
20. Lubricate cap screws (key 77) and attach cap (key 70) to the upper casing using cap screws (key 77). See Torque Specification table for proper torque.

Note

Rotate the cap such that the outer holes for sensing lines are in line with upper casing holes for sensing lines: to validate the alignment and before attaching cap, check that travel indicator is aligned on the cap and on the upper casing.

21. Mount O-ring (key 75) on the cap.
22. Screw the eye bolts (key 35) on the cap (key 70).

Disk Maintenance Type EZHSO DN 100 (Figure 19)

1. Remove cap screws (key 77).
2. Carefully lift the cap (key 70) off of the upper casing (key 11).
3. Remove O-ring (key 75). Inspect the O-ring for damage or wear, and replace if necessary.
4. Remove O-ring (key 69). Inspect the O-ring for damage or wear, and replace if necessary. Lubricate O-ring before placing inside cap.
5. Remove special screws (key 68) from sleeve.
6. Carefully remove the trim system from the sleeve guide utilizing the eye bolt (key 35) or stem nut.
7. Remove socket head cap screws (key 154).
8. Lift off the disk holder assembly (key 30).
9. Remove the O-ring (key 29). Inspect the O-ring for damage or wear, and replace if necessary. Lightly lubricate O-ring before placing in the sleeve adaptor (key 27).
10. Place disk holder assembly (key 30) into sleeve adaptor (key 27) and align screw holes.
11. Place on screws (key 154). Screw together the disk holder assembly into the sleeve adaptor assembly. See Torque Specification table for proper torque.
12. Lubricate the sleeve (key 14).
13. Carefully insert the trim system into the sleeve guide (key 61). Align sleeve utilizing the socket hex cap screw (key 74) as a guide.
14. Screw smart screws (key 68) to affix the sleeve system. See Torque Specification table for proper torque.
15. Place O-ring (key 69) on the cap (key 70).
16. Carefully place the cap on the upper actuator casing (key 11).
17. Lubricate cap screws (key 77) and attach cap (key 70) to the upper casing using cap screws (key 77). See Torque Specification table for proper torque.

Note

Rotate the cap such that the outer holes for sensing lines are in line with upper casing holes for sensing lines: to validate the alignment and before attaching cap, check that travel indicator is aligned on the cap and on the upper casing.

18. Mount O-ring (key 75) on the cap.

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Intermediate Flange O-ring Maintenance for Types EZH and EZHSO (DN 25, 50, and 80)

1. Remove screws (key 24).
2. Carefully lift the upper and lower actuator casing assembly (keys 11 and 5) off the body (key 1).
3. Remove cap screws (key 6).
4. Lift off intermediate flange (key 25).
5. Remove O-ring (key 7). Inspect the O-ring for damage or wear, and replace if necessary. Lightly lubricate O-ring before placing in the body (key 1).
6. Place the intermediate flange (key 25) on the body, make sure to position the screws (key 24) holes on the outside of the body (key 1). Secure with cap screws (key 6). See Torque Specification table for proper torque.
7. Continue with "Disk Maintenance" section, step 7.

Actuator Assembly Maintenance DN 25, 50, and 80

Type EZH Actuator Maintenance

1. Make a mark on the upper actuator casing (key 11) lower actuator casing (key 5), intermediate flange (key 25) and body (key 1) to indicate proper alignment.
2. Remove travel indicator assembly (keys 138, 139, 140, 141, 142, 143, 144, 145, and 192), by loosening the travel indicator fitting (key 141) and lifting out the travel indicator assembly.
3. Replace the two opposite bolts (keys 21, 22, and 23) with the two threaded stems and nuts delivered with the unit.

CAUTION

Secure the removal of the casings (keys 11 and 5) by finishing with these two threaded stems.

4. Remove screws, washers and hex nuts (keys 21, 22, and 23). Remove all the screws first, then the two threaded stems and bracket. Take care to balance the upper actuator casing while removing the spring tension. Carefully lift the upper actuator casing (key 11) off the lower actuator casing (key 5).
5. Remove spring (key 13).
6. Remove screws (key 16). Lift off diaphragm (key 20) and the inlet plate (key 18). Remove O-rings (keys 15 and 17). Inspect the diaphragm and O-rings for damage or wear, and replace if necessary.
7. Inspect the upper actuator casing (key 11), O-ring (key 9), anti-friction split rings (key 8), and anti-friction ring (key 4) for damage or wear. If damaged, remove the O-rings and split rings; replace with new parts. Lightly lubricate the O-ring and split rings. Place the split rings in the body first, then slide the O-ring between the split rings.
8. Remove screws (key 24). Lift off the lower actuator casing (key 5). Remove screws (key 33) and spring lock washers (key 32). Lift off the disk holder assembly (key 30) and disk retainer (key 31).
9. Slide the sleeve (key 14) out of the lower actuator casing (key 5) and slide the outlet plate (key 19) off the sleeve. Check the sleeve for scratches, burrs, or other damage and replace if necessary.
10. Remove the sleeve adaptor (key 27) from the sleeve (key 14). Take care not to damage the sleeve while removing the sleeve adaptor. Check the O-ring (key 28) for damage, and replace if necessary.
11. Place the sleeve adaptor on the sleeve and tighten.
12. Inspect the lower actuator casing (key 5), O-ring (key 9), anti-friction split rings (key 8), and anti-friction ring (key 4) for damage or wear. If damaged, remove the O-ring and split rings; replace with new parts. Lightly lubricate the O-ring and split rings. Place the split rings in the body first, then slide the O-ring between the split rings.
13. Slide the outlet plate (key 19) onto the sleeve (key 14) and slide the sleeve into the lower actuator casing (key 5). Place the disk holder (key 30) and disk retainer (key 31) on the sleeve adaptor (key 27). Insert the spring lock washers (key 32) and screws (key 33) and tighten. See Torque Specification table for proper torque.
14. Lightly lubricate the O-rings (keys 15 and 17) and the inner and outer diaphragm (key 20) edges. Place the inlet plate (key 18) and the diaphragm (key 20) on the sleeve (key 14). Make sure O-rings (key 15 and 17) are correctly positioned. Insert and tighten the hex socket cap screws (key 16). See Torque Specification table for proper torque.
15. Carefully lift the lower actuator casing assembly (key 5) and place on the body (key 1). Take care to match up the alignment marks. Secure with screws (key 24). See Torque Specification table for proper torque.
16. Lightly lubricate the spring (key 13) and place on the inlet plate (key 18).
17. Carefully place the upper actuator casing (key 11) on the lower actuator casing (key 5). Take care to match up the alignment marks. Insert the two threaded stems 180° apart and away from flanges. Place the washers and hex nuts (keys 22 and 23) and brackets on the long cap screws and evenly tighten. Install remaining small cap screws (key 21), washers, and hex nuts. Replace the two threaded stems by two bolts (keys 21, 22, and 23). See Torque Specification table for proper torque.
18. Place the travel indicator assembly (keys, 138, 139, 140, 141, 142, 143, 144, 145, and 192) in the upper actuator casing (key 11) by hitting the tip of the stem (key 139) to clip the fitting (key 144) into the plate (key 18) and tighten the travel indicator fitting (key 141).

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Type EZHSO Actuator Maintenance

1. Make a mark on the upper actuator casing (key 11), lower actuator casing (key 5), intermediate flange (key 25), and body (key 1) to indicate proper alignment.
2. Remove travel indicator assembly (keys 138, 139, 140, 141, 142, 143, 144, 145, and 192), if present, by loosening the travel indicator fitting (key 141) and lifting out the travel indicator assembly.
3. Remove protective cap (key 146). Loosen and remove hex nuts (key 151).
4. Remove cap screws (key 21), washers (key 22), and hex nuts (key 23). Remove protective cap (key 146) and remove hex nuts (key 151). Carefully lift the upper actuator casing (key 11) off the lower actuator casing (key 5).
5. Remove the socket head cap screws (key 16). Lift off the diaphragm (key 20) and the inlet plate (key 18). Remove O-rings (keys 15 and 17). Inspect the diaphragm and O-rings for damage or wear, and replace if necessary.
6. Inspect the upper actuator casing (key 11), O-ring (key 9), anti-friction split rings (key 8), and anti-friction ring (key 4) for damage or wear. If damaged, remove the O-ring and split rings, and replace with new parts. Lightly lubricate the O-ring and split rings. Place the split rings in the body first, then slide the O-ring between the split rings.
7. Remove screws (key 24). Lift off the lower actuator casing (key 5). Remove the hex socket cap screw (key 154). Lift off the disk holder assembly (key 30).
8. Slide the sleeve (key 14) out of the lower actuator casing (key 5) and slide the outlet plate (key 19) off of the sleeve. Check the sleeve for scratches, burrs, or other damage, and replace if necessary.
9. Inspect the lower actuator casing (key 5), O-ring (key 9), anti-friction split rings (key 8), and anti-friction ring (key 4) for damage or wear. If damaged, remove the O-ring and split rings, and replace with new parts. Lightly lubricate the O-ring and split rings. Place the split rings in the body first, then slide the O-ring between the split rings.
10. Slide the outlet plate (key 19) onto the sleeve (key 14) and slide the sleeve into the lower actuator casing (key 5). Place the disk holder assembly (key 30) on the sleeve adaptor (key 27). Insert the hex socket cap screw (key 154) and tighten. See Torque Specification able for proper torque.
11. Lightly lubricate the O-rings (keys 15 and 17) and the inner and outer diaphragm (key 20) edges. Place the inlet plate (key 18) and the diaphragm (key 20) on the sleeve (key 14). Make sure O-rings (keys 15 and 17) are correctly positioned. Insert and tighten the hex socket cap screws (key 16). See Torque Specification table for proper torque.
12. Carefully lift the lower actuator casing assembly (key 5) and place on the body (key 1). Make sure to match up the alignment marks. Secure with screws (key 24). See Torque Specification table for proper torque.
13. Carefully place the upper actuator casing (key 11) on the lower actuator casing (key 5). Make sure to match up the alignment marks. Insert the two long bolts 180° apart and away from flanges. Place the washers (key 22), hex nuts (key 23), and brackets (key 35) on the long bolts and evenly tighten. Using proper bolting techniques, install remaining short cap screws (key 21), washers, and hex nuts. See Torque Specification table for proper torque.
14. Tighten hex nuts (key 151), install protective cap (key 146).
15. Place travel indicator assembly (keys 138, 139, 140, 141, 142, 143, 144, 145, and 192) in the upper actuator casing (key 11), if present, and tighten the travel indicator fitting (key 141).

Type EZH DN 100 Actuator Assembly Maintenance (Figure 17)

1. Remove travel indicator assembly (keys 71, 138, 139, 140, 141, 142, 143, 144, 145, and 192), if present, by loosening the travel indicator fitting (key 141) and lifting out the travel indicator assembly.
2. Remove hex head cap screws (key 21), washers (key 22), and hex nuts (key 23). Carefully lift the upper actuator casing (key 11) off the lower actuator casing (key 5). Inspect the upper actuator casing (key 11), O-rings (key 9) and anti-friction rings (key 8) for damage or wear. If damaged, remove and replace with new parts. Place the anti-friction rings in the body first, then slide the O-ring between the anti-friction rings.
3. Lift off the diaphragm/plates system. Remove O-ring (key 15). Inspect diaphragm and O-rings for damage or wear, and replace if necessary.
4. Remove sleeve guide (key 61) utilizing cap (key 70) to unscrew.
5. Remove cage (key 78).
6. Remove seat ring (key 2). Inspect seat ring for damage or wear. If damaged, replace with new parts.
7. Remove O-ring (key 34) from body. Inspect for damage or wear. If damaged, replace with new parts.

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8. Lubricate O-ring (key 34) and replace into the body.
9. Place seat ring (key 2) on top of O-ring in body.
10. Place cage (key 78) on the top of seat ring (key 2).
11. Screw sleeve guide into lower casing (key 5) utilizing cap (key 70).
12. Lubricate the sleeve (key 14) in the upper plate contact area and assemble the diaphragm/plates system on the sleeve system.
13. Screw the smart screws (key 68) — already on the sleeve — to fix the diaphragm/plates system on the sleeve system. See Torque Specification table for proper torque.
14. Lubricate lower casing (key 5) on the diaphragm contact area.
15. Carefully insert the trim system into the sleeve guide (already assembled on the body) utilizing the eye-bolt (key 35) that fits in the ring nut (key 73) threaded hole.
16. Lubricate the diaphragm (key 20) on the upper casing contact area.
17. Carefully place the top actuator casing on the top of the lower actuator casing/trim system using a stud to guide.

Note

Rotate the upper casing such that the outer holes for sensing lines are perpendicular to gas flow.

18. Lubricate threads on bolts (key 21).
19. Bolt together the upper and lower actuator casings using bolts (key 21), washers (key 22), and nuts (key 23). See Torque Specification table for proper torque.
20. Lubricate and mount the O-ring (key 69) on the cap (key 70).
21. Lubricate and mount O-rings (key 9) and anti-friction rings (key 8) inside the cap (key 70).
22. Carefully place the cap on the upper casing (key 11).
23. Lubricate cap screws (key 77) and attach cap (key 70) to the upper casing using cap screws (key 77). See Torque Specification table for proper torque.
24. Mount O-ring (key 75) on the cap (key 70).
25. Screw the eye-bolts (key 35) on the cap (key 70).
26. Place travel indicator assembly (keys 138, 139, 140, 141, 142, 143, 144, 145, and 192) in the upper actuator casing (key 11), if present, and tighten the travel indicator fitting (key 141).

Type EZHSO DN 100 Actuator Assembly Maintenance (Figure 19)

1. Remove closing cap (key 146), unscrew 2 nuts (key 151). If present, remove travel indicator assembly by unscrewing the travel indicator fitting (key 141), then pull out the stem (key 139).
2. Remove hex head cap screws (key 21), washers (key 22), and hex nuts (key 23). Carefully lift the upper actuator casing (key 11) off the lower actuator casing (key 5). Inspect the upper actuator casing (key 11), O-rings (key 158) and anti-friction rings (key 157) for damage or wear. If damaged, remove and replace with new parts. Place the anti-friction rings in the cap first, then slide the O-ring between the anti-friction rings.
3. Unscrew 8 smart screws (key 68). Lift up and remove the sleeve assembly (key 14). Lift off the diaphragm/plates system. Remove O-ring (key 15) and replace as needed. Inspect diaphragm (key 20) for damage or wear, remove screws (key 16), lift off inlet plate (key 18) to replace diaphragm and O-ring (key 17) if necessary.
4. Unscrew 8 screws (key 77) to remove cap (key 70) from the upper casing (key 5). Align screw holes on the cap (key 70) to the sleeve guide screw (key 66). Remove sleeve guide (key 61) utilizing cap (key 70) to unscrew. Inspect O-rings (key 8), (key 64) and (key 153) for damage or wear, replace anti-friction ring (key 9) and O-ring (key 8) if necessary. Unscrew 8 bolts (key 6) and remove washer (key 67). Lift off lower casing (key 5). Inspect O-rings (key 7) and (key 63) for damage or wear, replace them if necessary.
5. Remove cage (key 78).
6. Remove seat ring (key 2). Inspect seat ring for damage or wear. If damaged, replace with new parts.
7. Remove O-ring (key 34) from body. Inspect for damage or wear. If damaged, replace with new parts.
8. Lubricate O-ring (key 34) and replace into the body.
9. Place seat ring (key 2) on top of O-ring in body.
10. Place cage (key 78) on the top of seat ring (key 2).
11. Place lower casing (key 5) on top of body. Replace washer (key 67) and tighten bolts (key 6). Screw sleeve guide into lower casing (key 5) utilizing cap (key 70).
12. Lubricate the sleeve (key 14) in the upper plate contact area and assemble the diaphragm/plates system on the sleeve system. Tighten screws (key 16) using a "star" criss-cross pattern for five times until proper specified torque is achieved.

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13. Screw the smart screws (key 68) — already on the sleeve — to fix the diaphragm/plates system on the sleeve system. See Torque Specification table for proper torque. Tighten screws (key 68) using a "star" criss-cross pattern until proper specified torque is achieved.
14. Lubricate lower casing (key 5) on the diaphragm contact area.
15. Carefully insert the trim system into the sleeve guide (key 61).
16. Lubricate the diaphragm (key 20) on the upper casing contact area.
17. Lubricate and mount the O-ring (key 69) on the cap (key 70). Lubricate and mount O-rings (key 9) and anti-friction rings (key 8) inside the cap (key 70). Carefully place the cap on the actuator upper casing (key 11). Align the travel indicator hole on the cap (key 70) to the upper casing travel indicator hole. Screw 8 screws (key 77) to tighten cap (key 70) to the upper casing (key 5). Carefully place the top actuator casing on the top of the lower actuator casing/trim system using a stud to guide.

Note

Rotate the upper casing such that the outer holes for sensing lines are perpendicular to gas flow.

18. Lubricate threads on bolts (key 21).
19. Bolt together the upper and lower actuator casings using bolts (key 21), washers (key 22), and nuts (key 23). See Torque Specification table for proper torque. Tighten screws (key 16) using a "star" criss-cross pattern for five times until proper specified torque is achieved.
20. Assemble one nut (key 151) to the stem (key 147) until achieve specified torque, and then assemble another nut (key 151) to lock position of stem. Screw on the closing cap (key 146). Mount O-ring (key 75) on the cap (key 70).
21. If present, set the stem (key 139) through the casing hole and tap it into the groove in the diaphragm plate (key 18). Slide the travel indicator fitting (key 141) over the stem and tighten to the cap (key 70).

Type EZH OS2 Regulator with Slam-shut Maintenance (Figure 20)

1. Unscrew the BMS (safety manometric box) impulse line connector.
2. Remove cover (key 57) from the mechanism box (BM).
3. Unscrew fastening screw (key 51).
4. Remove holding pin.
5. Remove mechanism box.
6. Unscrew screws (key 50) from the connecting part (key 48).
7. Remove connecting part (key 48), O-rings (keys 56 and 49) and if necessary the two guide rings (rep. 54).
8. Remove spring (key 55) and valve plug (key 46).
9. Unscrew bypass (key 53) and remove valve O-ring.
10. Removing the seat (key 52) (not recommended) from the body (key 47) requires a special extraction tool.

Type PRX Pilot Maintenance (Figure 23)

CAUTION

Always remove spring (key 7) tension before performing maintenance on this unit.

To remove spring tension loosen locknut (key 2) and backout adjusting screw (key 1) until compression is removed from the spring.

Lower Case Maintenance

1. Disconnect pilot and remove it from the line.
2. Remove screws (key 10) from lower cover (key 21) and the separate lower cover from the body (key 16).
3. Use a wrench to hold the stem (key 23) and break loose the stem nut (key 20). Remove the stem nut and washer (key 11).
4. Remove the diaphragm plate (key 13), diaphragm (key 14), pad holder (key 22) and O-ring (key 18). Inspect parts for damage or wear, replace if necessary.
5. Remove orifice (key 19) and O-ring (key 17). Inspect the parts for damage or wear, and replace if necessary. Lightly lubricate the O-ring and place in the body (key 16). Install the orifice.
6. Set the pad holder (key 22) in the body (key 16).
7. Lightly lubricate the rims of the diaphragm (key 14) and place it on top of the pad holder (key 22). Set the diaphragm plate (key 13) on the diaphragm (key 14).
8. Lightly lubricate the O-ring (key 18) and place it in the lower case (key 21).
9. Place the washer (key 11) and stem nut (key 20) on the stem (key 23) and tighten.
   If also performing upper case maintenance, skip to step 2 of "Upper Case Maintenance" section.
10. Insert screws (key 10) in the lower cover (key 21) and tighten uniformly to ensure proper seal.

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Upper Case Maintenance

1. Disconnect pilot and remove it from the line.
2. Loosen locknut (key 2) and backout adjusting screw (key 1) until compression is removed from the spring. Remove cap (key 3).
3. Lift the spring carrier (key 6) the spring (key 7) and O-ring (key 4) out of the upper cover (key 8). Inspect the O-ring and replace if necessary.
4. Remove screws (key 10) from lower cover (key 21) and separate lower cover from the body (key 16), unless removed during lower diaphragm maintenance. Use a wrench to hold stem (key 19) securely while removing the stem nut (key 26).
5. Remove remaining loose components: washer, upper diaphragm plate, diaphragm, lower diaphragm plate and O-rings (keys 11, 13, 14, 15, 18, and 25). Inspect diaphragm and O-rings for damage or wear, and replace if necessary.
6. Lightly lubricate the O-ring (key 25). Place the O-ring over the stem (key 19) and press it down into the body (key 16).
7. Set the lower diaphragm plate (key 15) into the body (key 16).
8. Lightly lubricate the rims of the diaphragm (key 14) and place it in the body (key 16) on top of the lower diaphragm plate (key 15).
9. Set the upper diaphragm plate (key 13) on top of the diaphragm (key 14).
10. Place washer (key 11) and stem nut (key 26) on the stem (key 23) and tighten using a wrench to hold the stem.
11. Set the spring carrier (key 6).

Damper and Restrictor Maintenance

1. Remove the screw (key 31) and plate (key 29).
2. Remove bolts (key 30).
3. Remove the damper adjusting screw (key 27). Remove and inspect O-ring (key 28) for damage or wear, and replace if necessary. Lightly lubricate O-ring before placing on the adjusting screw. Insert damper adjusting screw into the body (key 16) and tighten. Insert ring nut (key 30) and tighten. Back out damper adjusting screw until it stops.
4. Remove restrictor adjusting screw with hole (key 32). Remove and inspect O-ring (key 28) for damage or wear, and replace if necessary. Lightly lubricate O-ring before placing on the adjusting screw. Insert restrictor adjusting screw into the body (key 16) and completely tighten. Insert ring nut (key 30) and completely tighten. Back out restrictor adjusting screw 1/2 turn.

Note

When using a Type PRX/120 pilot with a Type PRX/125 pilot as monitor, follow these steps:

- **Restrictor: completely tighten and then back out three full turns,**
- **Damper: back out until it stops.**

5. Install plate (key 29) and screw (key 31).

Type SA/2 Pilot Supply Filter Regulator Maintenance (Figure 24)

1. Disconnect pilot supply filter regulator and remove it from the line.
2. Remove bolts, washers, and nuts (keys 2, 9, and 10) from the body (key 7), then separate upper and lower covers (keys 19 and 11) from the body (key 7). When separating the covers from the body, be aware of loose components: (keys 1, 3, 4, 8, 12, 18, 20, and 21).
3. Remove and inspect O-ring (key 13) for damage or wear, and replace if necessary. Lightly lubricate the O-ring before placing it back in the filter cover (key 11).
4. Clean nets (key 8). Replace filter pad (key 12).
5. Inspect diaphragm (key 18) for damage or wear, and replace if necessary. Check the seating surface of the screw unit (key 17) for erosion, scratches, spurs, or other damage, and replace if necessary.
6. Unscrew and remove the regulator seat (key 5). Inspect the O-ring (key 6) for damage or wear, and replace if necessary. Lightly lubricate the O-ring and place it on the regulator seat.
7. Pull pad holder unit (key 15) out of the body (key 7). Inspect the seat for damage, replace if necessary.
8. Set the filter net (key 8) on the spring (key 14) and insert the regulator seat (key 5). Tighten the regulator seat until it stops.
9. Lightly lubricate the outer and inner rims of the diaphragm (key 18). Place the diaphragm assembly on top of the regulator seat (key 5). The screw unit (key 17) will slide into the regulator seat (key 5). Take care to avoid damage to parts when reassembling.
10. Set the spring (key 1, version Type EZH spring diameter 3, on top of the nut (key 21).
11. Align the regulator cover (key 19) over the body (key 7), with the sense port (V) opposite the pilot supply port (R).
12. Place the filter pad (key 12) and nets (key 8), one on each side of the filter pad, on the filter cover (key 11).
13. Pick up the body (key 7) and place it on the filter cover (key 11), with the inlet port (M) aligned vertically with the sense port (V).
14. Insert bolts (key 2). Place washers (key 9) and nuts (key 10) on the end of the bolts. Tighten the nuts.

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TROUBLESHOOTING

Servicing Check

Operations concerning the integral slam-shut version are in italic

Recommended frequency:

- 2 times per year

Verification:

- *Set point verification*
- Regulator valve plug tightness
- *Tripping and setpoint value*
- *Slam-shut valve tightness*

Starting positions:

- Inlet valve → Open
- Outlet valve → Open
- *Slam-shut valve plug* → *Open*
- Regulator → In operation

Inlet and outlet side of the regulator are under pressure

Tight shut-off verification (and tripping verification for versions with integral slam shut)

- Inlet valve → Closed
- Outlet valve → Closed
- Regulator — Observe the evolution of the outlet pressure
  Control regulator tightness

Table 9. *Troubleshooting for Types EZH and EZHSO Regulators*

SYMPTOMS	CAUSE	ACTIONS
If outlet pressure is stable		
Observe the evolution of the inlet pressure		
If inlet pressure decreases	External leak	Locate and repair leak or contact after-sales
If inlet pressure is stable	The regulator is tightshut	*Increase the set point until tripping occurs (without exceeding the outlet limits)*
If the slam-shut valve plug will not close	*Operation faulty*	*Control the release relay* *Control the slam-shut valve plug or contact after-sales*
If the slam-shut valve plug closes	*Operation correct*	*Bleed off outlet side*
Close the vent and observe the evolution of the outlet pressure		
If the outlet pressure increases	*Valve plug internal leak*	*Control the release relay* *Control the valve plug and slam-shut orifice or contact after-sales*
If the outlet pressure is stable	*The valve plug is tightshut*	
If the outlet pressure increases	Internal leak	Close pilot feed
If the outlet pressure stabilises	Pilot leak	Control the pilot valve plug or contact after-sales
If the outlet pressure increases	Regulator internal leak	Control valve plug and orifice or contact after-sales

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Table 10. *Torque Specifications*

DN	SCREW (Key 21 - Figures 16, 17, 18, and 19)			SCREW (Key 24 - Figures 16 and 18)			SCREW (Key 6 - Figures 16, 17, 18, and 19)			SCREW (Key 50 - Figure 20) (Key 1 - Figure 21)		
	METRIC	SPANNER	TORQUE N.m	INCHES	SPANNER	TORQUE N.m	INCHES	SPANNER	TORQUE N.m	INCHES	SPANNER	TORQUE N.m
25	M12	19	70	1/2"-13X7/8"	3/4"	110	9/16"-12X2"	13/16"	75	9/16"-12X1"3/4	13/16"	110
50	M16	24	190	1/2"-13X1"			1/2"-13X1"1/4	3/4"		1/2"-13X1"1/2	3/4"	
80	M22	32	350	3/4"-10X2"	1"1/8"	150	5/8"-11X1"1/2	15/16"	100	5/8"-11X1"3/4	15/16"	175
100	M27	41	400				3/4"-10X3"	1"1/8	200	3/4"-10X2"1/4	1"1/8	260
DN	SCREW (Key 16 - Figures 16, 17, 18, and 19)			SCREW (Key 33 - Figures 16 and 17)			TRAVEL INDICATOR FITTING (Key 141 - Figures 16, 17, 18, and 19)			SCREW (Key 51 - Figure 20)		
	METRIC	SPANNER	TORQUE N.m	METRIC	SPANNER	TORQUE N.m	METRIC	SPANNER	TORQUE N.m	METRIC	SPANNER	TORQUE N.m
25	M5	Allen 4	6,5	M4	Allen 3	4	M16	19 (M12)	30	M8	13	15
50	M6	Allen 5	7	M5	Allen 4	6,5						
80				M6	Allen 5	10						
100	M8	Allen 6	12	M6				20				
DN	SCREW (Keys 68 and 74 - Figures 17 and 19)			SCREW (Key 77 - Figures 17 and 19)			SCREW (Key 154 - Figures 18 and 19)					
	METRIC	SPANNER	TORQUE N.m	METRIC	SPANNER	TORQUE N.m	METRIC	SPANNER	TORQUE N.m			
25							M4	Allen 3	4			
50							M6	Allen 5	7			
80							M8	Allen 6	12			
100	M5	Allen 4	4	M16	20	135	M4	Allen 3	4			
DN	STEM NUT (Key 151 - Figures 18 and 19)			HEX NUT (Key 152 - Figures 18 and 19)			STEM NUT (Key 155 - Figures 18)					
	METRIC	SPANNER	TORQUE N.m	METRIC	SPANNER	TORQUE N.m	METRIC	SPANNER	TORQUE N.m			
25	M10	17	43				M8 SPECIAL	19	41			
50				M12	19	54						
80			61			81						
100						68						

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SPARE PARTS

Different parts of the equipment are subject to normal wear: they must be checked periodically and replaced if necessary.

The frequency of control and replacement of parts depends on the working conditions as well as any applicable codes and regulations.

Table 11. *Spare Parts*

KEY	DESCRIPTION	QUANTITY	DN 25	DN 50	DN 80	DN 100	
STANDARD SPARE PARTS (Figures 16, 17, 18, 19, and 20)							
	Type EZH OS2 kit	-	197569	197570	197571	197824	
	Type EZH kit	-	197575	197576	197577	197826	
	Type EZHSO OS2 kit	-	197889	197890	197891	197908	
	Type EZHSO kit	-	197895	197896	197897	197907	
	Slam-shut installation kit	-	197785	197786	197787	197827	
	Type OS2 release relay		Refer to NTAOS2 manual				
KEY	**DESCRIPTION**	**QUANTITY**	**TYPES EZH AND EZHSO DN 25**	**TYPES EZH AND EZHSO DN 50**	**TYPES EZH AND EZHSO DN 80**	**TYPE EZH DN 100**	**TYPE EZHSO DN 100**
OPTIONAL SPARE PARTS (Figures 16, 17, 18, and 22)							
2	Standard regulator seat	1	GD29726X012	GD29581X012	GD29732X012	M0303250X12	ERAA00273A0
	Seat reduction 1	1	M0300940X12	M0300950X12	M0300960X12	M0303430X12	ERAA00274A0
	Seat reduction 2	1	M0300910X12	M0300920X12	M0300930X12	M0303420X12	ERAA00275A0
	Seat reduction 3	1	M0300710X12	M0300720X12	M0300730X12	M0303410X12	ERAA00276A0
161	Silencer (Whisper III)	1	ERAA00238A0	GE37959X012	GE38021X012	M0303520X12	M0303520X12
PILOT SPARE PARTS							
4, 5, 14, 17, 18, 22, 25, and 28	Type PRX kit (Figure 22)	1	M2200685X12				
6, 12, 13, 15, and 18	Type SA/2 kit (Figure 23)	1	M2200250X12				

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PARTS LIST

Type EZH (Figures 16, 17, 18, and 19)

Key	Description
1	Body
2	Seat
3	Cage
4*	Anti-friction ring
5	Actuator lower casing
6	Cap screws
7*	O-ring
8*	Anti-friction ring
9*	O-ring
10	Pipe Plug
11	Actuator upper casing
13	Spring
14	Sleeve
15*	O-ring
16	Screw
17*	O-ring
18	Inlet plate
19	Outlet plate
20*	Diaphragm
21	Screw
22	Washer
23	Nut
24	Screw
25	Intermediate flange
27	Sleeve adaptor
28*	O-ring
29*	O-ring
30*	Disk holder assembly
31	Disk retainer
32	Lock washer
33	Socket head cap screw
34*	O-ring
35	Bracket
38	Travel indicator plug
44	Adjusting screw cap
61	Sleeve guide
62*	O-ring
63*	O-ring
64*	O-ring
66	Screw
67*	Washer
68	Smart screw
69*	O-ring
70	Cap
71*	O-ring
72	Lock washer
73	Upper spring seat
74	Socket head cap screw
75*	O-ring
77	Screw
78	Cage
82	Lower spring seat
83	Ball bearings
138	Indicator cover
139	Stem
140	Indicator bushing
141	Fitting
142*	O-ring
143*	O-ring
144	Spring collet
145	Retaining ring
192	Nameplate

Type EZHSO (Figures 18 and 19)

Key	Description
146	Protective cap
147	Stem
148	Upper spring axe
149	Lower spring axe
150*	Anti-friction ring
151	Stem nut
152	Hex nut
153*	O-ring
154	Hex socket cap screw
155	Stem nut
156	Upper spring seat adapter
157*	Anti-friction ring
158*	O-ring
159	Check valve
193	Washer

Type EZH OS2 Release Relay (Figure 20)

Key	Description
45*	O-ring
46	Valve plug
47	Body
48	Fitting
49*	O-ring
50	Screw
51	Screw
52	Seat
53*	Bypass
54*	Guide ring
55	Spring
56*	O-ring
57	Cover

Type EZH "X Body" (Figure 21)

Key	Description
1	Screw
2*	O-ring
3*	O-ring
4	Bottom
5	Seat
6	O-ring

Type EZH Silencer (Figure 22)

Key	Description
161	Attenuation Module
2	Seat
34*	O-ring

Check Valve (Figure 26)

Key	Description
159	Check valve
160	Male tube connector

* Spare parts kit

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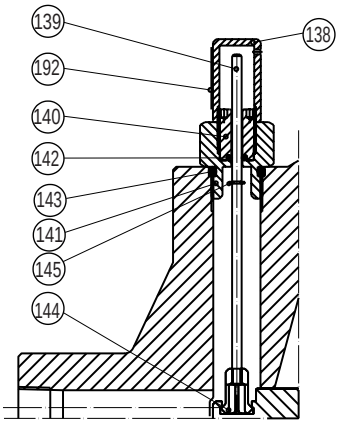

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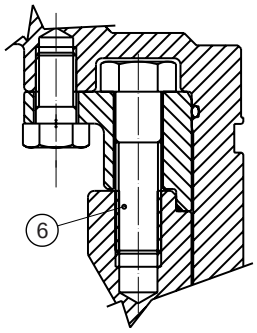
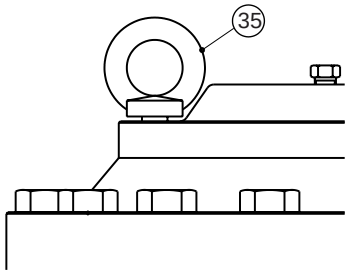


TYPE EZH DN 25 VERSION ONLY



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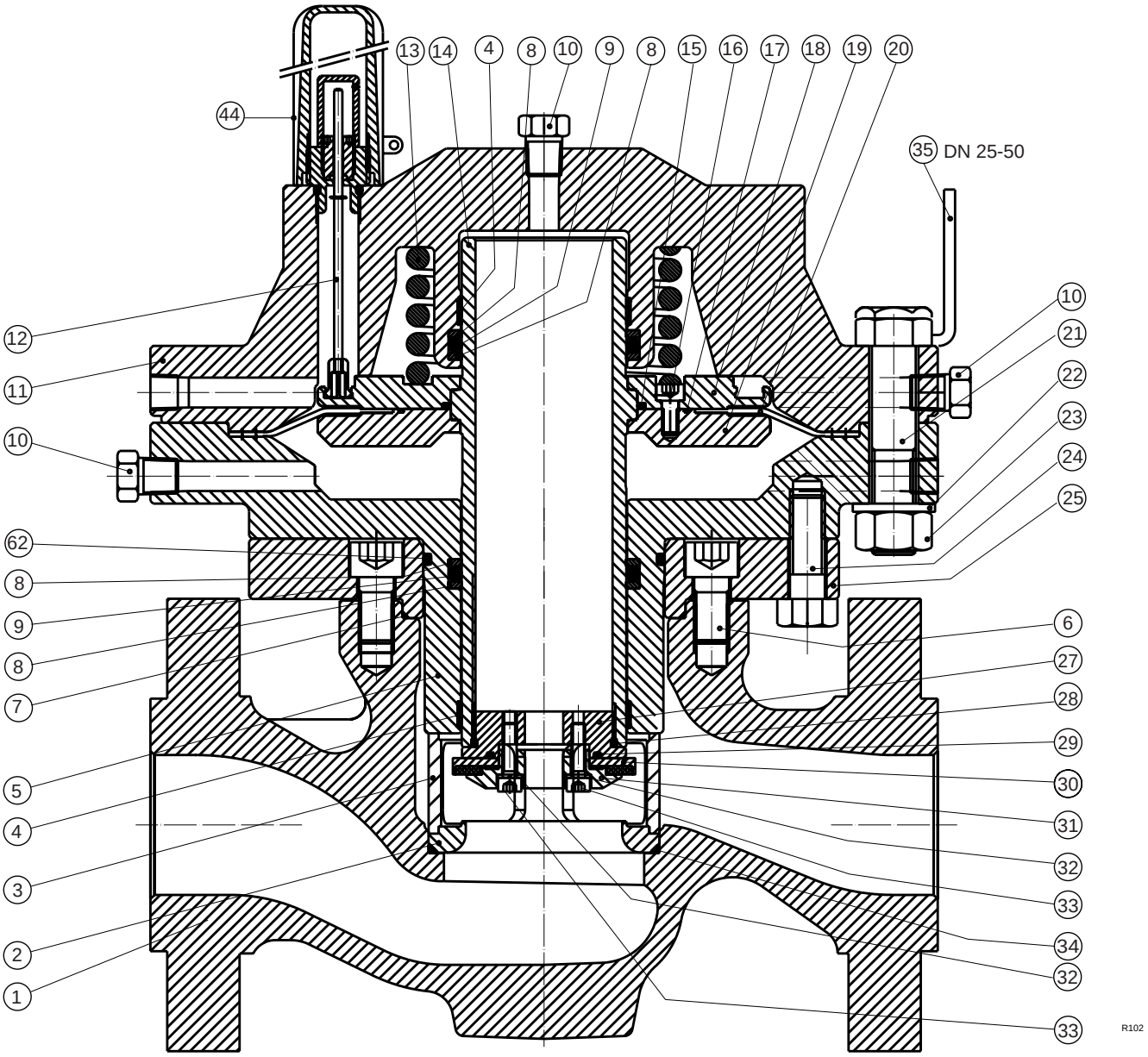

Figure 16. *Type EZH Main Valve Assembly (DN 25, 50, and 80)*

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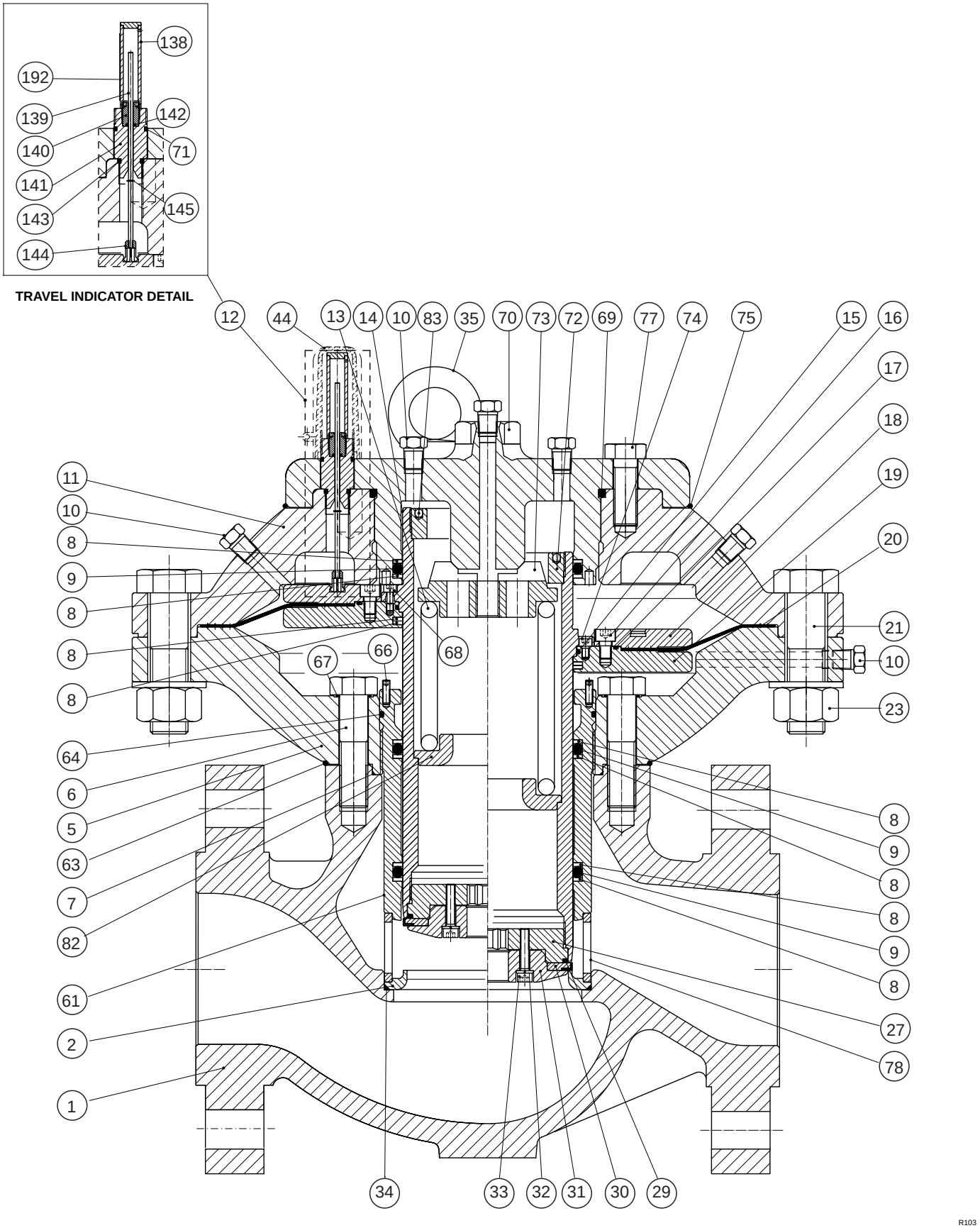

Figure 17. *Type EZH Main Valve Assembly (DN 100)*

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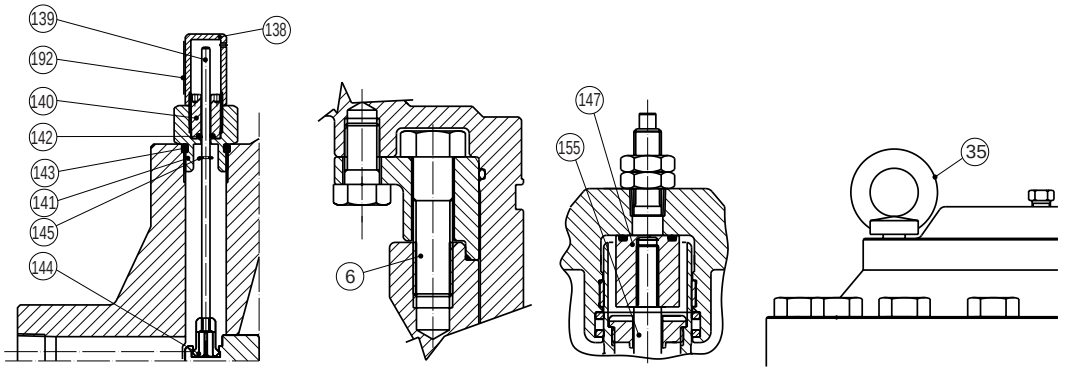

TRAVEL INDICATOR DETAIL **TYPE EZHSO DN 25 VERSION ONLY** **TYPE EZHSO DN 80 VERSION ONLY**

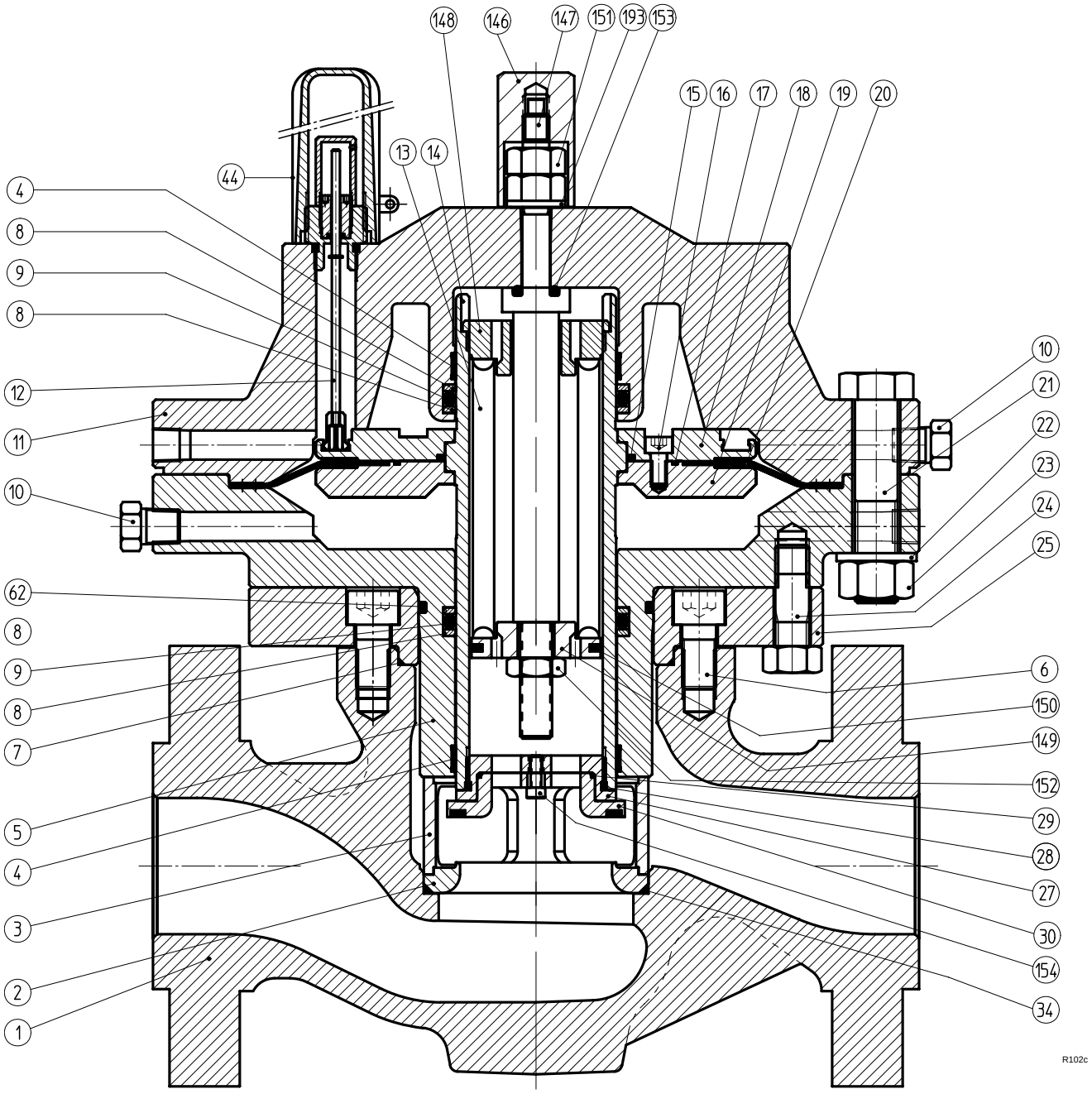

Figure 18. *Type EZHSO Main Valve Assembly (DN 25, 50, and 80)*

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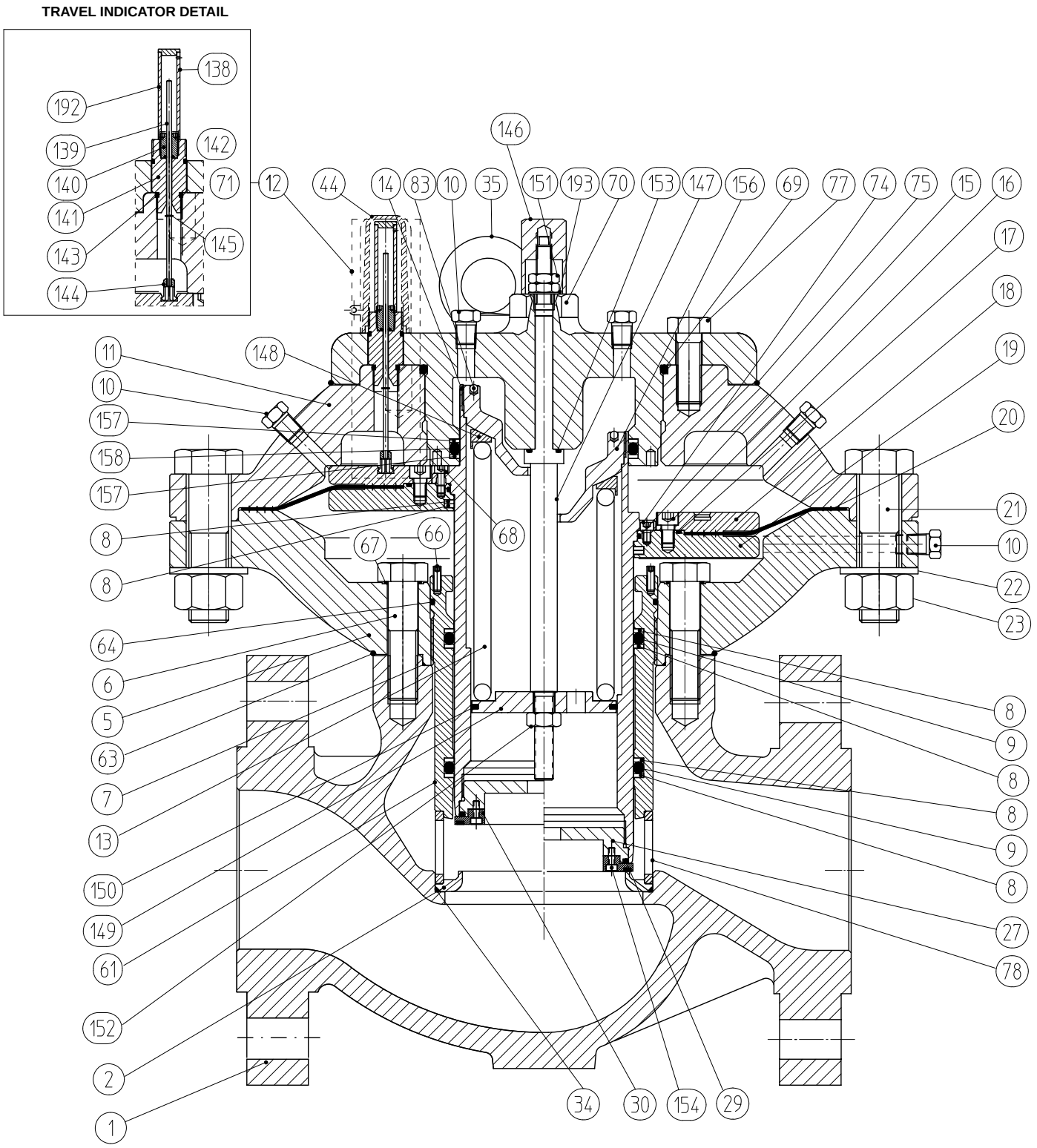

Figure 19. *Type EZHSO Main Valve Assembly (DN 100)*

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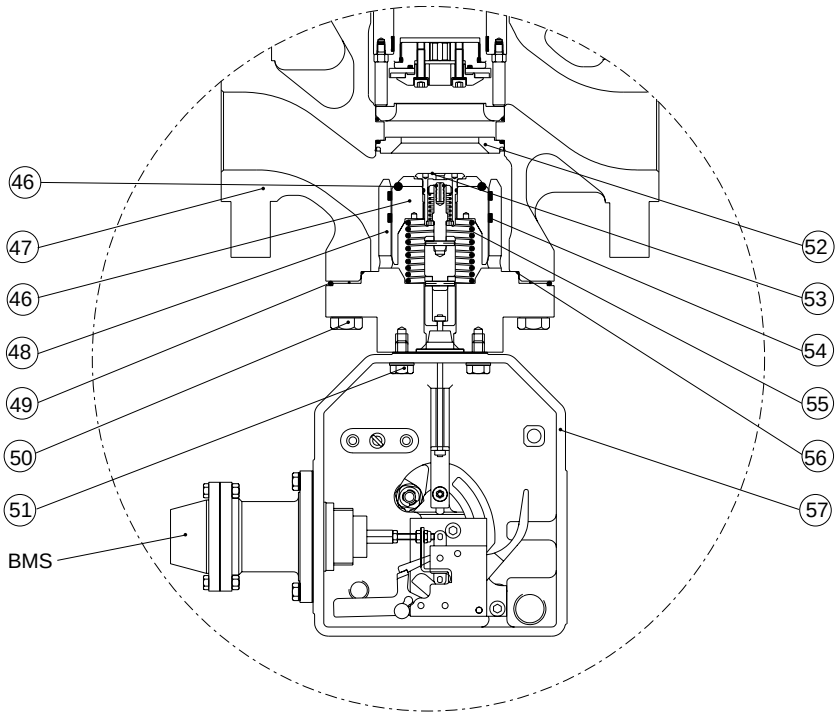

Figure 20. *Type EZH OS2 (Slam-Shut Version)*

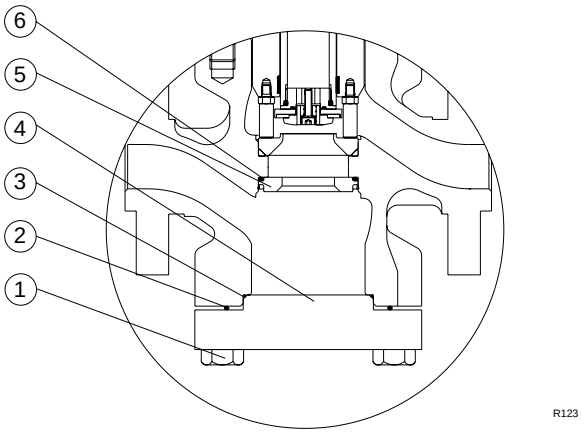

Figure 21. *Type EZH "X Body"*

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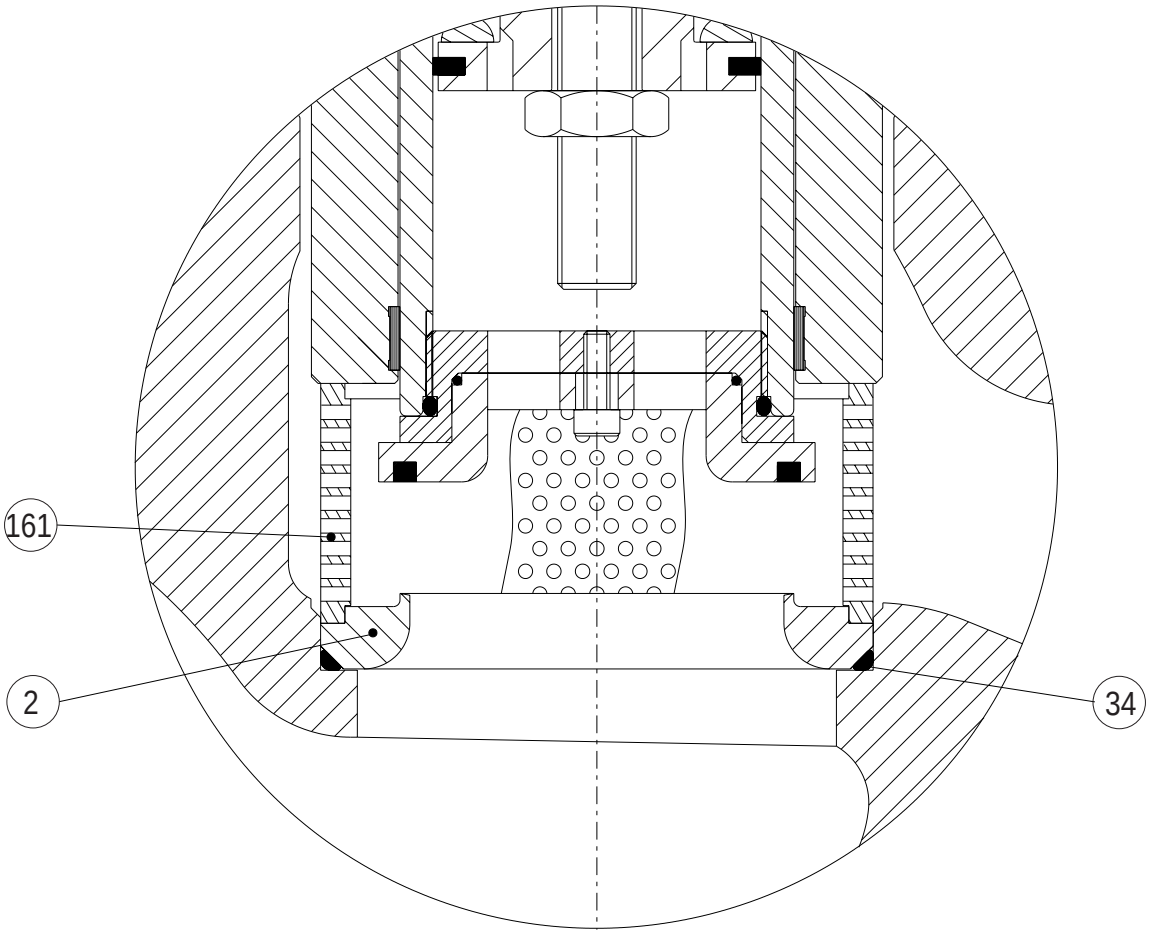

Figure 22. *Type EZH Silencer Detail*

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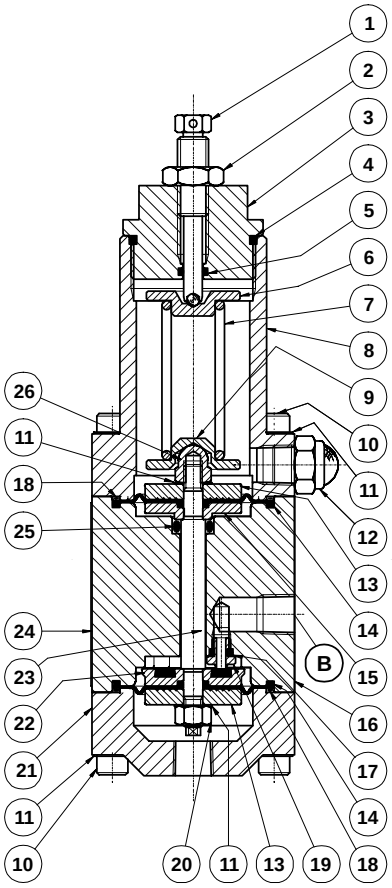
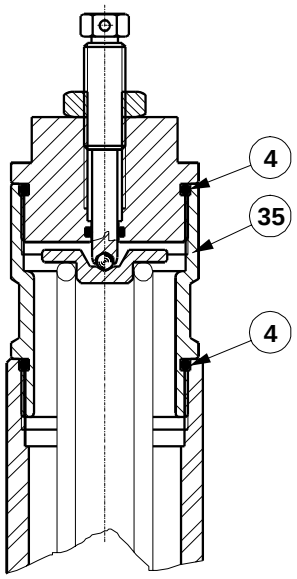


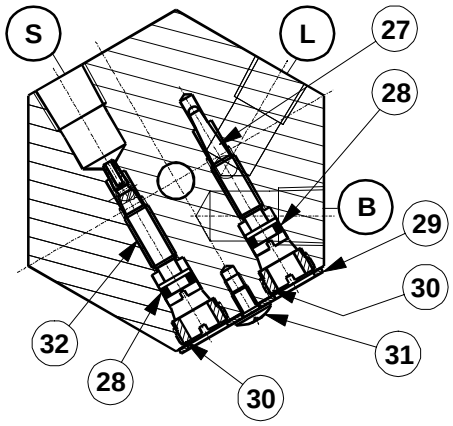
R106

TYPE PRX/120 OR PRX/125



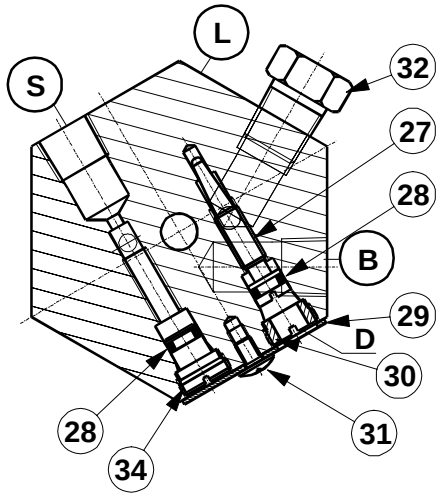
R107

TYPE PRX/120-AP OR PRX/125-AP



R108

TYPE PRX/120 OR PRX/120-AP



R109

TYPE PRX/125 OR PRX/125-AP

Figure 23. *Types PRX/120 and PRX/125 Pilots*

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Type PRX Pilot (Figure 23)

Key	Description
1	Adjusting screw
2	Locknut
3	Cap
4*	O-ring
5*	O-ring
6	Spring carrier plate
7	Spring
8	Spring cover
9	Spring carrier plate
10	Screw
11	Washer
12	Filter
13	Diaphragm plate
14*	Diaphragm
15	Diaphragm plate
16	Body
17*	O-ring
18*	O-ring
19	Orifice
20	Nut
21	Lower cover
22	Diaphragm plate
23	Stem
24	Nameplate
25*	O-ring
26	Nut
27	Damper adjusting screw
28*	O-ring
29	Plate
30	Nut
31	Damper/Restrictor screw
32	Restrictor adjusting screw
33	Plug
34	Plug
35	Spring barrel extension for AP

Type SA/2 Pilot Supply Filter Regulator (Figure 24)

Key	Description
1	Spring
2	Bolts
3	Washer
4	Plate
5	Seat
6*	O-ring
7	Body
8	Filter net
9	Washer
10	Nut
11	Filter cover
12*	Filter
13*	O-ring
14	Spring
15*	Pad holder unit
16	Nameplate
17	Screw unit
18*	Diaphragm
19	Regulator cover
20	Spring Washer
21	Nut

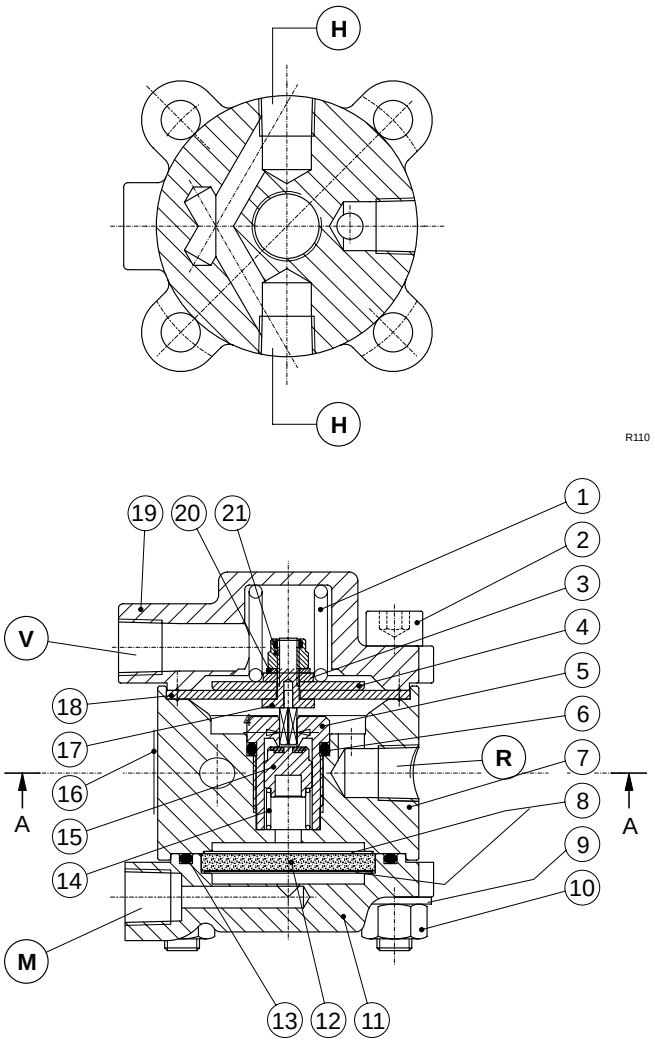

Figure 24. *Type SA/2 Assembly*

* Spare parts kit

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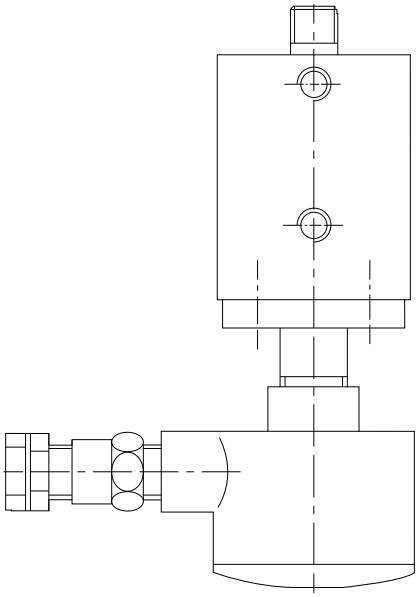

Figure 25. *Type RPE Pilot Heater*

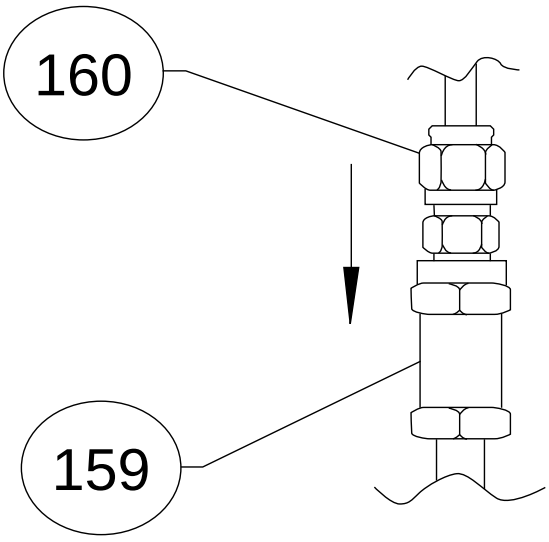

Figure 26. *Check Valve*

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Types EZH and EZHSO

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Natural Gas Technologies

Emerson Process Management
Regulator Technologies, Inc.

Francel SAS
Z.A. La Croix Saint Mathieu
28320 Gallardon, France
Tel.: +33 (0)2 37 33 47 00
Fax: +33 (0)2 37 31 46 56

O.M.T. Officina Meccanica Tartarini s.r.l.
Via P. Fabbri, 1
I - 40013 Castel Maggiore (Bologna), Italy
Tel.: +39 051 4190611
Fax: +39 051 4190715
E-mail: info.tartarini@emerson.com

For further information visit www.emersonprocess.com/regulators

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